INSIDE: GODZILLA MEETS THE MEGA-MAP

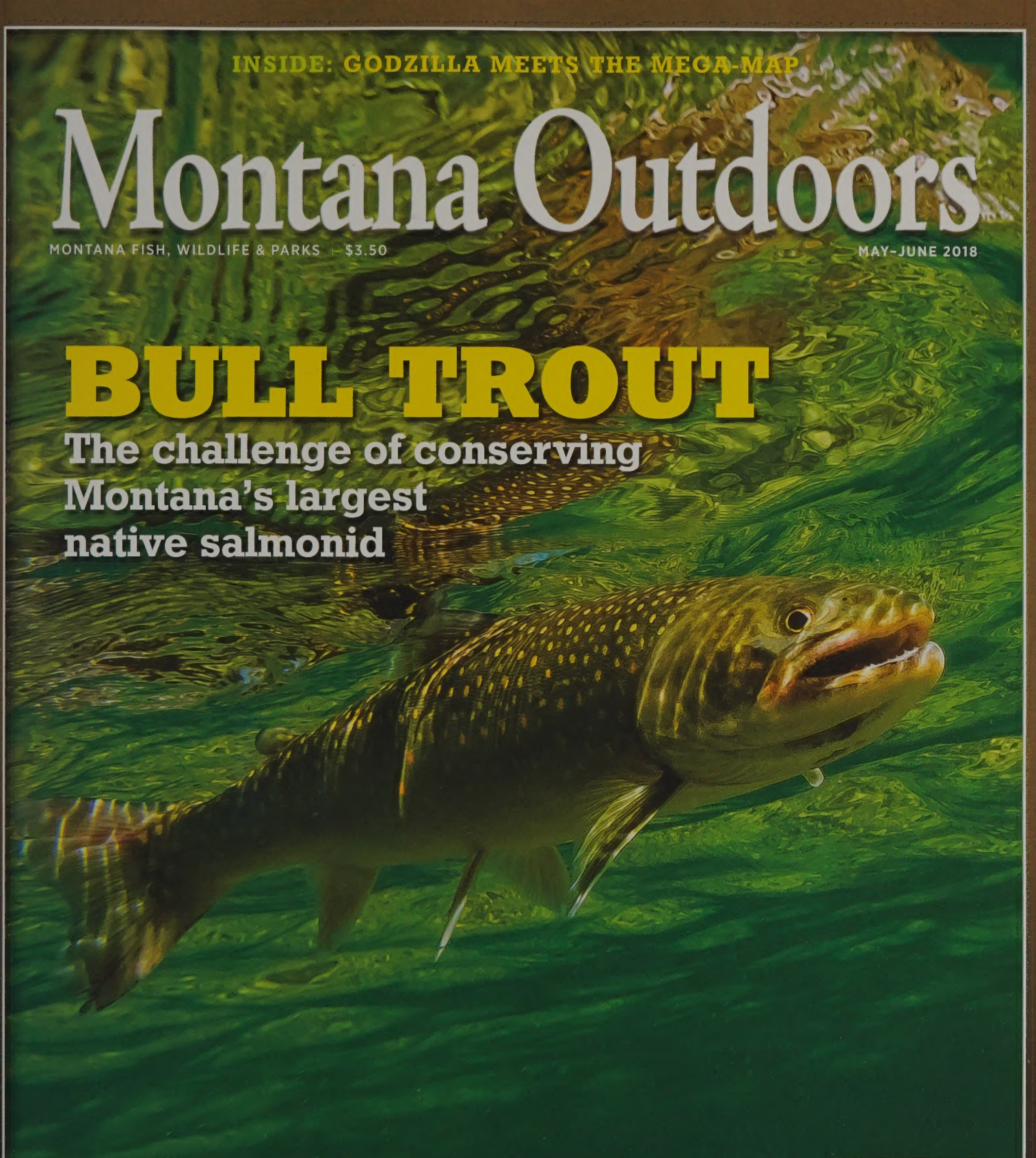
Montana Outdoors

MONTANA FISH, WILDLIFE & PARKS | $3.50

MAY–JUNE 2018

BULL TROUT

The challenge of conserving Montana's largest native salmonid



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FISHERIES BUDGET WOES

IS SNIPE HUNTING REALLY A THING?

50 YEARS OF WILD AND SCENIC RIVERS

A RECIPE YOU'LL LOVE (BUT YOUR KIDS WON'T)

FIRST PLACE MAGAZINE: 2005, 2006, 2008, 2011, 2017
SECOND PLACE MAGAZINE: 2007, 2009, 2012, 2015, 2016
Awarded by the Association for Conservation Information

FIRST PLACE MAGAZINE: 2012
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Montana Outdoors

MAY–JUNE 2018

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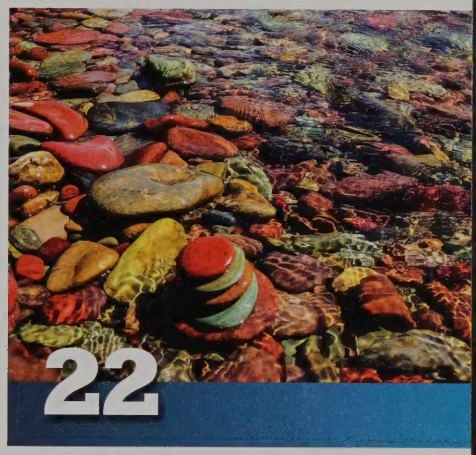

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THE REAL MCCOY A still-popular summertime prank is just one reason Wilson's snipe remain little known even among those who spend time outdoors. See what they don't know on page 10. Photo by Jeremie Hollman.

FRONT COVER The combination of warming waters and non-native invaders challenges fish conservationists trying to recover this federally threatened species. See page 14 to see what they've accomplished. Photo by Lon E. Lauber.

The channel tells all

This is in regards to the article "Happy Cows, Happy Trout" in the March-April issue, which I enjoyed. However, the pictures on pages 22 and 23 are misleading. The "before" picture looks like it was taken in winter when everything is dead and has been grazed. The "after" looks like it was taken in spring, when everything has sprung back to life (after being fenced). I'd bet if that second picture had been taken in winter there would not have been a whole lot of difference in vegetation. I am sure there is a nice difference after this spot was fenced, but these pictures don't prove it to me, due to the fact they were taken at different times of year.

John Backs
St. Ignatius

Sunni Heikes-Knapton, Madison Conservation District watershed coordinator, replies: The real indication of this stream's recovery is the width of the channel, not the vegetation. The channel width upstream from the diversion structure provides the best point of reference. In the "before" photo, the channel is about 12 feet wide and very shallow. In the "after" photo, stream width is about 4 feet and much deeper. This reach above the diversion has remained narrow for years, regardless of the season or vegetation growth, thanks to wise management by landowner Janet Endecott.

His heart's in the right place

Some years back, a woman asked me what I liked about Montana. I told her it would be easier for me to tell her what I *didn't* like about Montana: nothing. I thought of that when reading your essay "Good To Be Back" (September-October 2017), one of the best I've ever seen in your magazine. When I retired, I wanted to move to Montana because of its breath-

HAPPY COWS, HAPPY TROUT
How a watershed coordinator, a rancher, and an FWP fisheries biologist found a way to conserve water and restore habitat on a Madison River tributary.

taking beauty and abundance of hunting, fishing, and other recreational opportunities. That didn't work out, but if it had, that would have been me as the old guy inviting his son out to join him for a few weeks of hunting and fishing. From the first sentence to the last, the writer had me totally involved in the adventure as if I were there—and believe me, I wanted to be.

Gerald Eswein
Wisconsin Rapids, WI

All-Montana team

I noticed that the return address on your subscription renewal is Boone, Iowa. Why is *Montana Outdoors* published in Iowa? Don't you have people in Montana who can do this work?

Margaret Fuller
Billings

Editor replies: Montana Outdoors *is indeed published here in Montana. Boone, Iowa, is the home of CDS, Inc., known in the magazine industry as a "fulfillment house." CDS handles subscription services, renewal notices, address changes, and billing for* Montana Outdoors *and hundreds of other magazines throughout the United States. One way we can keep our subscription prices low is by using CDS rather than hiring those individual services in Montana. The three of us who comprise the magazine staff—all Montana Fish, Wildlife & Parks employees—reside in Helena and East Helena.*

The three of us who comprise the magazine staff—all Montana FWP employees—reside in Helena and East Helena.

Lead and eagles

I am disappointed that you would publish unfounded and self-serving opinions to promote the already noble goal of preserving bald eagles ("The Eagles Have Landed," November-December 2017). California officials promoted a lead bullet ban for hunting across that state on the evidence that the one condor in their study that died in captivity showed trace elements of lead in its system. There was no supporting evidence to show the lead content in the blood of other animals, or humans, in that same area to ascertain if this was an unusual level or not. The vast majority of wild condors died from bridging high power lines. In your article, Montana Audubon's Janet Ellis offered that ingesting lead will reduce an eagle's life or "kills birds outright." *Outright*? Did it choke on the bullet? Montana FWP uses trained professionals, applying real data, to manage Montana's game. I urge *Montana Outdoors* to employ this same due diligence. I believe that this great article should stand on its own merit and this publication should not publish unfounded opinions to promote personal agendas.

John T. Ranaudo
Manhattan Beach, CA

Editor replies: It's widely accepted among veterinarians and raptor research scientists that ingesting even trace amounts of lead, often found in gut piles and carcasses of bullet-killed animals, can poison eagles and other raptors, causing sickness or death. Those worrisome findings have convinced a growing number of hunters to voluntarily switch to all-copper bullets.

Another convert

I give a *Montana Outdoors* gift subscription to my husband, and he in turn has prepared for me two recipes for braised venison from the November-December 2015 and November-December 2017 issues. Count him among those who used to cut up the shanks from our Pennsylvania whitetails to grind into burger. But now, after braising shanks as described in your recipes, we agree that it's an absolutely delicious way to use these cuts of venison.

Marie Hrinkonich
Jim Thorpe, PA

Speak your mind

We welcome all your comments, questions, and letters to the editor. We edit letters to meet our needs for accuracy, style, and length. Write to us at Montana Outdoors, *P.O. Box 200701, Helena, MT 59620-0701. Or e-mail us at: tdickson@mt.gov.*

Savory Pan-Roasted Pheasant

Preparation time: 10 minutes | Cooking time: 12–18 minutes | Serves 4

RIKKI SNYDER

Some of the world's most delicious dishes are made with some of the most unlikely ingredients. Many scrumptious Asian foods contain a dash of fermented fish sauce. French recipes often call for a teaspoon of tomato paste. Italian casseroles and stews receive a topping of pungent Parmesan cheese. Americans top their burgers and steaks with sautéed fungi (mushrooms). Then there's crumbled bleu cheese, which smells like an old gym locker yet somehow adds an appetizing tang to salads.

All these ingredients impart a savory, soul-satisfying taste that, in cooking circles, is called umami. A Japanese word variously translated as "yummy," "deliciousness," or "a pleasant savory flavor," umami is now considered by food scientists as the fifth taste category (in addition to sweet, sour, bitter, and salty). It's the unique, savory flavor in cheeses, smoked meats, meat broths, mushrooms, the flavor enhancer MSG, and even catsup.

This delicious umami-packed game dish is based on *New York Times* food writer Melissa Clark's Garlicky Chicken With Lemon-Anchovy Sauce. Lemon-*anchovy* sauce? I know. The thing is, anchovy fillets pack a powerful umami flavor. Though inedible to many (including me) on their own, they greatly enhance other flavors like garlic and lemon.

As with braising venison shanks, you'll have to trust me on this one; the dish is fantastic. However, it's not a big hit with most kids, who usually don't appreciate sour, bitter, or umami flavors until they reach adulthood.

—Tom Dickson

INGREDIENTS

1 ¼ lbs. pheasant breasts or thighs (or 4-5 skinless chicken thighs)*
½ c. flour, seasoned with salt and pepper
1 egg, beaten with 1 T. water
½ c. panko bread crumbs
¼ c. extra-virgin olive oil
5 garlic cloves, peeled and smashed
5 anchovy fillets
2 T. drained capers, patted dry
1 large pinch red pepper flakes
¼ c. white wine
1 lemon, halved
Fresh chopped parsley, for serving

DIRECTIONS

Place the flour, beaten egg, and bread crumbs each in separate shallow bowls.

In a large skillet, over medium heat, add the oil. When the oil is hot, add the garlic, anchovies, capers, and pepper flakes. Cook, stirring to break up the anchovies, until the garlic browns around the edges and the anchovies dissolve, 3 to 5 minutes. Push the ingredients out of the way against the side of the skillet.

Pat dry the pheasant and dredge each piece in flour, egg, then bread crumbs. With your fingers, press the crumbs into the egg mixture. Add the pheasant to the skillet and cook until nicely browned on one side, 4 minutes*.

Flip the meat and cook another 4 minutes, until it is cooked through.

When the pheasant is done, transfer it to a plate. Add to the skillet the white wine and the juice of one lemon half. Cook for 30 seconds, scraping up the browned bits on the bottom of the pan. Return the pheasant to the pan and cook in the sauce for another 15 to 30 seconds.

Transfer everything to a serving platter. Squeeze the remaining lemon half over the pheasant and garnish with chopped parsley.

Serve with potatoes, rice, or egg noodles.

*For pheasant thighs, increase all cooking times by 50 percent. For chicken thighs, double cooking times.

A little more state, a little less federal

It seems to defy logic.

Last fall, FWP had to cut slightly more than $1 million from our fisheries management budget. Revenue was substantially down while operating costs continued to rise, so the cuts were essential to balance the budget.

Yet anyone who has been fishing in Montana can't fail to notice that streams, rivers, reservoirs, lakes, and fishing access sites statewide are filled with anglers. You'd think FWP would have plenty of angling license revenue to fund fisheries management.

This shortfall has not come from a drop in state fishing license sales (angler numbers in Montana remain steady). It's the result of declines in national expenditures for fishing gear and boat fuel over the past several years. A portion of those total sales is sent to every state each year as part of the federal Dingell-Johnson Program. Historically, roughly 75 percent of Montana's fisheries budget came from D-J (the percentage, set by the Montana Legislature, is now about 60 percent).

When anglers in Texas, Florida, and New York aren't buying new rods, reels, lures, and boats, that sets off a fiscal chain reaction reverberating all the way to Montana.

Balancing our fisheries budget with declining federal revenue meant cutting programs. Senior Fisheries Division staff met with fisheries workers across the state. They decided it made the most sense to cut programs and projects that had the fewest long-term effects and whose absence would do the least harm overall. To identify these programs and projects, FWP went through a "zero-budgeting" process. We started with a fisheries management budget of zero dollars and built it with essential costs for each program.

Legislative mandates and previous department commitments kept two big programs off the table: aquatic invasive species and fishing access sites. Cuts had to come elsewhere.

In all regions, we cut maintenance, supplies, intern programs, and travel; new fish management and hatchery equipment; and FWP's contribution to stream-flow monitoring. We also cut hatchery fish production and stocking statewide.

Two positives emerged from this painful process. We have a better understanding of our fisheries program's top priorities, and we've found ways to manage Montana's diverse fisheries more efficiently and cost effectively.

Still, these cuts have been tough on FWP's dedicated and hard-working fisheries staff—especially our hatchery crews. The cuts won't be easy on anglers, either, especially those who fish stocked lakes and reservoirs and those who check stream-gauge data for river flows, levels, and temperatures.

We're hoping the program reductions will be temporary, and we aim to restore base operations budgets to former levels, though reallocated to meet newly identified priorities such as more emphasis on native fish conservation and management. We're also working to pay for key programs with other federal funding sources and will lean on watershed groups and other organizations for funding help. This is a perfect example of how we can't—and don't—go it alone. We rely heavily on our partners. We'll need them more than ever as we work to resolve this funding dilemma.

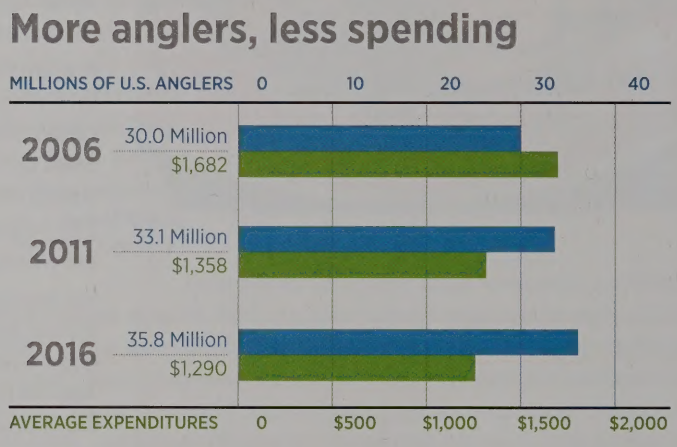
The good news is that restoring our base fisheries budget won't require a fishing license fee increase at the next legislative session.

Right now the FWP General License Account has a surplus. But because of how our budget is structured, we need the 2019 Montana Legislature to grant FWP the authority to change the ratio of state funds to federal funds that comprise our fisheries budget from the current 60:40 to about 50:50.

In other words, we have the cash; we just need permission from lawmakers to use a bit more of it.

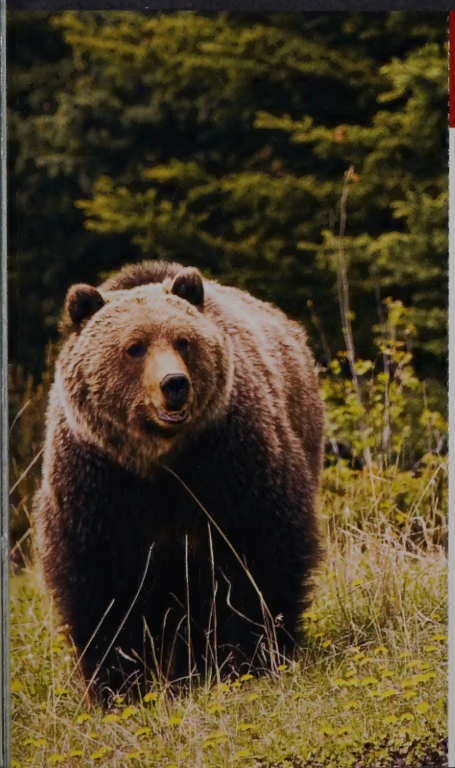
Each year more than 270,000 resident and nonresident anglers fish in Montana, spending $900 million on lodging, food, travel, and related items. FWP promises to effectively and efficiently manage the fisheries and habitats that support that valuable recreation economy. In early 2019, we'll be requesting authority from the Montana Legislature to adjust our funding ratio of state and federal dollars so we can fulfill that promise.

—**Martha Williams**, Director, Montana Fish, Wildlife & Parks



More than half the FWP fisheries budget comes from a portion of taxes on angler expenditures nationwide. When spending goes down, so does federal revenue to the states, which is the situation FWP finds itself in.

SOURCE: USFWS



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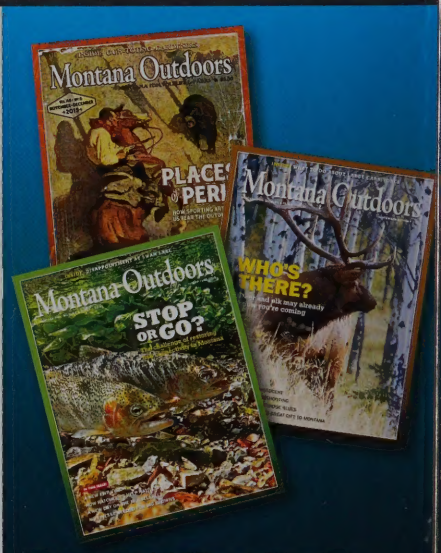

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JOHN WARNER

SHIPMATE

CALEB BOLLMAN Fisheries Biologist, Miles City

One of the most rewarding things about my job is the variety of work I get to do from a boat. Each March, with the help of volunteers from Walleyes Unlimited, my FWP colleagues and I use our 18-foot jet boat to transport and sink Christmas trees for fish habitat in Spotted Eagle Lake. In the spring, the boat transports us up and down the lower Yellowstone River as we electrofish sauger and blue suckers, and net paddlefish, pallid sturgeon, and shovelnose sturgeon, to help a fellow biologist with his native species telemetry study. The boat becomes a mobile operating room as we surgically fit fish with radio transmitters as part of the study. Then, with a long-poled antenna added to the bow, it becomes a tracking device to follow the fish up and down the river so we can document their movements throughout the year.

We use the boat to take Miles City government employees on the Yellowstone to inspect the levee for weak spots requiring maintenance, and to transport local conservation district members inspecting permitted bank stabilization projects. Each June we head out in the boat to collect shovelnose sturgeon brood stock from the Tongue River that produce young reared at the Garrison National Fish Hatchery in North Dakota for restoration stocking in Wyoming's Bighorn River drainage. In August we use the boat to monitor the Tongue River Reservoir crappie and walleye fisheries using electrofishing and gill nets, and then in the fall we head back out to the Yellowstone River to sample both sport and nongame fish to get a picture of the whole fishery.

A dedicated crew, routine boat maintenance, and rigorous attention to "Clean, Drain, Dry" protocols keep this boat on the water, helping FWP benefit anglers, our community, and fisheries science.

SNAPSHOT

No, Helena photographer **Kevin League** was not flying next to these sandhill cranes when he took this photo. But he was waiting in exactly the right place, near Lake Helena, at dawn. "Actually, I was on the ground, and they had just taken off and were only about 20 feet in the air," he says. "But because the horizon was so low, it looks like they are way up in the clouds and that I'm up there, too." League had been watching the cranes before takeoff and could see they were perfectly lit as they took flight. "I just unloaded on them with dozens of shutters—what we photographers call 'spray and pray'—and a few turned out great. I particularly like this image for conveying a sense of just how wonderful it must be to fly." ■

100

Approximate number of wild adult pallid sturgeon remaining in Montana

BOW turns 25 in Montana

This year marks the 25th anniversary of Montana's Becoming an Outdoors-Woman (BOW) Program.

BOW was formed in 1990 in Wisconsin and now operates in 38 states and six Canadian provinces. Montana conducted its first BOW class in 1994. Since then, dozens of experienced volunteers have introduced hundreds of women to outdoor skills by providing them with information, encouragement, and hands-on instruction in a safe and supportive learning environment. Classes include fishing, shooting, archery, map and compass reading, outdoor survival, kayaking, backpacking, and more.

This year, the Montana BOW Program celebrates its 25th anniversary with three summer weekend workshops for women age 18 and older. For more information about BOW in Montana, and to register for a workshop, visit the FWP website and click on "Education." ■

INVASIVE SPECIES

FWP, DNRC, and others step up AIS monitoring for 2018

In late 2016, invasive mussel larvae were detected in Tiber Reservoir and suspect samples were collected from Canyon Ferry Reservoir. Since then, Montana has stepped up its efforts to prevent these and other invasive species from spreading in state waters.

This year the Aquatic Invasive Species (AIS) Programs of FWP and the Department of Natural Resources and Conservation, along with other partner agencies and organizations, will operate more than 40 watercraft inspection stations at key sites across Montana. FWP will also increase water sampling to see if invasive mussels and other damaging species are present in lakes, reservoirs, and rivers.

Liz Lodman, FWP AIS information officer, says boaters should be familiar with the state regulations created to prevent the spread of aquatic invaders:

- All motorized and nonmotorized watercraft (including canoes, kayaks, paddleboards, rafts, and drift boats) must stop at open inspection stations.
- When entering Montana, all motorized and nonmotorized watercraft must be inspected before they can be launched on any Montana waterbody.
- All watercraft traveling west across the Continental Divide into the Columbia River Basin must be inspected before launching.
- Inspections are required for all watercraft coming off Tiber and Canyon Ferry Reservoirs. Hot water decontamination may be required.

AIS crews try to move boats through inspection stations as quickly as possible. "But they also have to be thorough," Lodman says. Boaters can speed up the process by taking a few easy steps beforehand:

- remove all water, mud, and vegetation from the boat, trailer, and anchor;
- remove the boat plug and drain;
- open and towel dry all compartments and livewells;
- drain ballasts and bilge and, if possible, wipe bilge areas dry;
- lower the motor to allow water to drain;
- clear through-hull fittings; and
- be prepared to lower the motor, open livewells, and assist with the inspection. ■

Learn more about what Montana is doing to stop aquatic invaders at CleanDrainDryMT.com.

Anglers can help by knowing AIS regulations and preparing their boats for inspection.

STATE PARKS

State park ram is the world's biggest

A bighorn ram that spent its life on Wild Horse Island State Park in Flathead Lake boasts the world's largest horns of its species.

In February, official scorers with the Missoula-based Boone & Crockett Club measured the deceased ram's horn length and circumference and scored it as 216 3/8 points, shattering the previous record of 209 1/8 points. Senior Boone & Crockett officials later confirmed the ram as the world's largest.

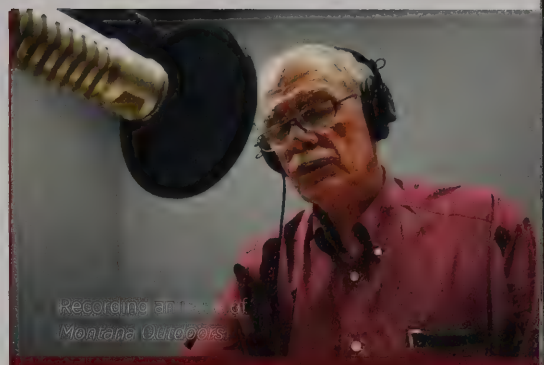
Wild sheep enthusiasts swoon over horns that measure over 205 points and top 45 pounds. The new world-record ram's horns weighed 50 pounds.

In late 2016, after a visitor to the island reported seeing a large ram that seemed injured, an FWP game warden visited the area and found the sheep's carcass. Because it is illegal to pick up bighorn sheep horns anywhere in Montana, wardens remove them to eliminate the temptation. The bighorn sheep, estimated at nine years old based on horn growth rings, died of natural causes. The skull and horns were kept in cold storage for a year, along with two other large sets previously retrieved from the island by FWP employees.

In the fall of 2017, FWP decided the three bighorn sheep should be measured in case they merited Boone & Crockett record book status. Employees suspected that one might be a world record and that the other two could rank in the top 10, which turned out to be the case.

Montana purchased Wild Horse Island in the early 1970s using federal Land and Water Conservation Fund dollars. Off limits to hunting, the roughly 2,000-acre state park is also home to wild horses, mule deer, bald eagles, and other wildlife. FWP manages the island to conserve its native shortgrass prairie and ponderosa pine forest. The sheep herd, numbering about 100, is used to supplement other herds throughout the region. ■

CLOCKWISE FROM TOP LEFT: CARTOON BY MIKE MORAN; ELIZA WILEY; SHUTTERSTOCK; SHUTTERSTOCK; MONTANA FWP; MONTANA FWP



MONTANA OUTDOORS FOR THE BLIND

Do you know someone with visual impairment who would enjoy an audio version of *Montana Outdoors*? Montana Fish, Wildlife & Parks' popular magazine is available from the Montana Talking Book Library, a service of the Montana State Library in Helena. Locally trained volunteers use the library's digital recording studio to narrate and record each issue of *Montana Outdoors* as well as *Montana The Magazine of Western History*.

The library also loans qualifying Montanans digital audio players, headphones, and other equipment for listening to the magazines on tapes, which are mailed out regularly.

The free library service requires certification of blindness, low vision, or physical disabilities that restrict reading standard print materials. For an application to subscribe to the service, contact the Montana Talking Book Library at (800) 332-3400, (406) 444-4799 (TTY/TTD), or 444-2064 (in Helena), or mtbl@mt.gov. ■

Searching for Snipe

Thought by many to be a fictional creature, Wilson's snipe is actually a common—though extraordinary—shorebird found across the state. By Ellen Horowitz

SINKING FEELING [illegible]

While my husband and I were visiting old friends at their farm near Whitefish one early June evening, I occasionally heard a hollow, whistling sound from varying locations high in the sky. As I craned my neck to find the source of the peculiar melody, our friend Walt asked what I was looking for.

"Snipe. Do you hear that sound?"

He nodded.

"Don't you just love that snipe music?" I assumed that, as an avid bird hunter, he already knew about snipe, so my next question came with honest intent.

"Have you ever gone snipe hunting?"

"You mean with a flashlight and brown paper bag?"

"Very funny. I'm serious. Montana has a snipe hunting season."

Walt's skepticism changed when his wife, Mary Jane, handed him a field guide to birds, open to a page with a picture and description of Wilson's snipe, *Gallinago delicata*.

"Well, I'll be. I've heard that sound my whole life and never knew what it was."

No other bird requires as many explanations as the snipe. It's best known as a fictitious creature invented for playing a practical joke on kids and others new to the outdoors. The real snipe is known by very few people. And no wonder. It's a secretive, mostly solitary shorebird rarely recognized except by those who know its wet habitat and mystical music.

Bleating goats in the sky

The snipe's quavering tune, known as winnowing, is the fabled bird's most distinguishing—and mysterious—characteristic. The melody is an eerie *hu-hu-hu-hu-hu-hu-*

LEFT TO RIGHT: PUBLISHED BY CURRIER & IVES, C. 1880 | LIBRARY OF CONGRESS; KEN ARCHER

hu-hu that sounds unlike any other bird you've ever heard. Adding to its otherworldly aura, the snipe typically begins its haunting tune around twilight as it flies high in the darkening sky, virtually invisible.

For centuries people mistook the snipe for a mythical creature. Farmers in northern Germany believed the supernatural sound came from a team of bleating goats pulling a chariot across the sky. Swedes attributed snipe winnowing to a whinnying horse in heaven. Fishermen in early day New England associated the timing of snipe music with the upstream spawning runs of shad. They believed the tremulous tunes came from the shad spirit. In the mid-1800s, author and naturalist Henry David Thoreau described the bird's call as a "peculiar spirit-suggesting sound."

Even naturalists who approached the bird from a scientific perspective long struggled to explain the source of the sound. Was it vocal? Was it made by the snipe's wings or tail feathers—or both? For more than half a century they debated and conducted experiments to determine the sound's origin. The answer came in 1907, when Sir Philip Manson-Bahr, an English physician and zoologist, examined the snipe's outer tail feathers under a microscope. The magnified view revealed extra barbules (hooks) on the feathers that make them stronger and more resistant to wear and tear caused by vibrations when the bird performs high-speed dives. When a snipe dives through the air, it splays its outside tail feathers and cocks its wings to keep the rushing air from shredding the tail. Created by air moving through the wing and tail feathers, winnowing occurs when the bird's dive speeds reach between 25 and 50 miles per hour.

Winnowing refers to both the flight pattern and the resulting sound. Both male and female snipe winnow, but males do so much more frequently. The behavior serves as a territorial defense that warns off other males while attracting the attention of females. The displays sometimes include aerial acrobatics such as bursts of upside-down flight.

I hear the first winnowing of spring in early April, and snipe music fills the air in May and June. The sound carries far, but it's surprisingly difficult to pinpoint where in the sky it comes from. The snipe, a robin-sized bird, looks incredibly tiny as it flies 100 yards or more above the ground. It's also a rapid flyer. I might hear the first bleating high to my left. By the time I glance in that direction, the sound beckons to my right. I rubberneck again only to hear the winnowing transmit from another location. Eventually I find the snipe and track its wide circular flight path and roller-coaster plunges.

It takes practice to locate the speedy speck of a high-flying snipe through binoculars. I often look without aid of optics.

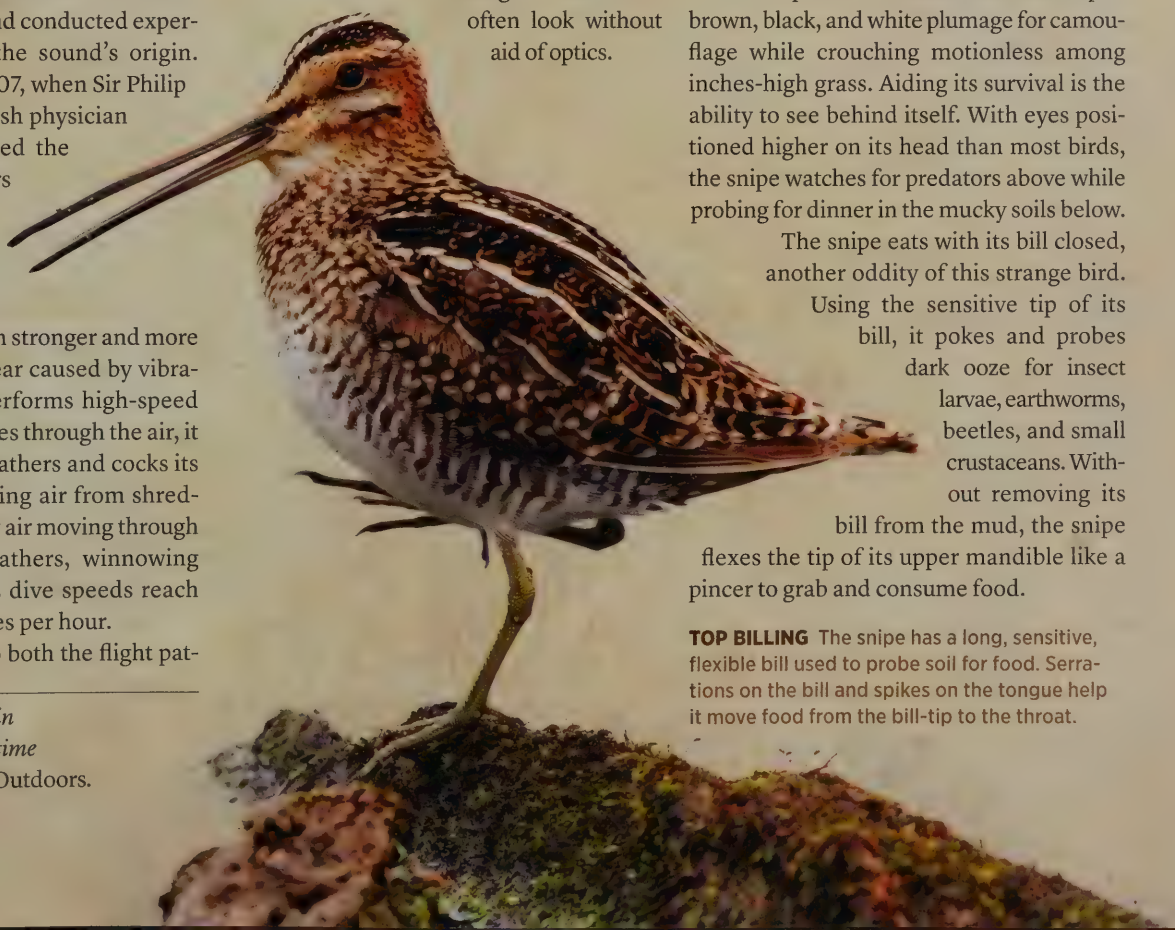
During the breeding season, snipe music typically occurs at dawn and dusk with two notable exceptions. On clear moonlit nights, the snipe bleats all night long. And when the barometric pressure drops drastically, it sometimes winnows throughout the day.

Split-custody parents

After selecting a male's territory and mating, the female prepares a simple grass-lined nest on the ground near a shallow marsh or wet meadow. For 18 to 20 days, she incubates four speckled, brown-and-olive eggs. The male plays no part in incubation, but several days before the eggs hatch he ends his aerial antics and prepares for parental duties. He listens for the peeps of his soon-to-appear offspring and then, within hours of hatching, he guides two chicks away from their mother. Each parent broods and feeds its well-camouflaged youngsters in a unique split-custody arrangement that's believed to reduce predation.

The snipe relies on its mottled and striped brown, black, and white plumage for camouflage while crouching motionless among inches-high grass. Aiding its survival is the ability to see behind itself. With eyes positioned higher on its head than most birds, the snipe watches for predators above while probing for dinner in the mucky soils below.

The snipe eats with its bill closed, another oddity of this strange bird. Using the sensitive tip of its bill, it pokes and probes dark ooze for insect larvae, earthworms, beetles, and small crustaceans. Without removing its bill from the mud, the snipe flexes the tip of its upper mandible like a pincer to grab and consume food.



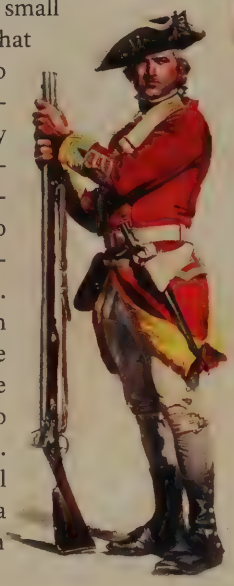
TOP BILLING The snipe has a long, sensitive, flexible bill used to probe soil for food. Serrations on the bill and spikes on the tongue help it move food from the bill-tip to the throat.

Ellen Horowitz, a writer in Columbia Falls, is a longtime contributor to Montana Outdoors.

Real snipe hunting

In 1861, John James Audubon described the snipe's diet and credited the bird's choice of foods for providing the "richness of flavor and tenderness for which [the snipe] is so deservedly renowned." In his book, *Life Histories of North American Shorebirds*, Arthur Cleveland Bent wrote, "Probably more snipe have been killed by sportsmen than any other game birds." In the United States, snipe hunting remained a popular sport into the early 20th century.

The term "sniper" originated in the late 1700s and referred to British soldiers in India who hunted snipe for food. The sniper's ability to hit a small zigzagging target that reached speeds of up to 60 miles per hour required extraordinary skill. "Sniper" later became a term for military marksmen who could kill enemy soldiers at a long distance.



Eventually, concern over declining snipe populations in the United States led to hunting regulations. By 1941, the federal government placed a 13-year moratorium on snipe hunting. When the season reopened in 1954, the tradition was mostly lost to the next generation of hunters. In Montana, a fall snipe hunting season exists, but few people pursue the lightning-fast birds, according to Jim Hansen, Montana Fish, Wildlife & Parks' Central Flyway migratory bird coordinator in Billings. Despite the snipe's widespread abundance, says Hansen, only a few hundred hunters pursue the bird in Montana each year, harvesting an average of about one snipe each.

CRACK SHOTS Left: The term "sniper" originally referred to 18th-century British soldiers in India who could hit a tiny, zigzagging snipe in flight. Later it became a term for military marksmen who could kill enemy soldiers at a long distance. Above: A snipe displays its tail plumage.

Snipe hunting today is rare elsewhere in the United States, too, though many upland bird hunters, often employing pointing dogs, still pursue the closely related woodcock in Midwestern and Eastern hardwood forests. Snipe hunting remains popular among some hunters in Europe.

Left holding the bag

The "snipe hunt" as a form of prank or practical joke dates to the mid-19th century and

Finding snipe in spring and fall

Wilson's snipe are found throughout Montana. In early spring, the shorebirds often perch on roadside fenceposts near flooded agricultural fields and pastures and along the edges of marshes and other wetlands. If lucky enough to view one, your first look will probably be a double take. This medium-size shorebird, and member of the sandpiper family, sports a 2½-inch-long bill. The name "snipe" comes from the old English word meaning "snout." Eighteen species of snipe exist worldwide. In North America, Wilson's snipe (formerly called common snipe) is our only representative.

Listen to the call and winnowing of Wilson's snipe through the Cornell Lab of Ornithology's "All About Birds" website at www.allaboutbirds.org/guide/Wilsons_snipe/sounds.

Hunters find snipe in September and October in shallow marshes and wet meadows as the birds migrate south to warmer climes for the winter. Though snipe are migratory game birds regulated by seasons and limits, a federal or state "duck stamp" is not required to hunt them.

CLOCKWISE FROM FAR LEFT: WIKIPEDIA; DONALD M. JONES, THE CHARLESTON MUSEUM; WIKIPEDIA; FRANCIS BERGQUIST; HUNTER CREEK AUDUBON, LANCASTER ONLINE

continues to be played. It's often used as a rite of passage at summer camps and with Boy Scout troops. Snipe hunters are often left alone outside at night and told to wait quietly or make strange noises to attract the "snipe"—sometimes described as a small, furry creature like a squirrel or tiny deer. The others promise to chase the creatures toward the newcomers. But instead, they return home or to camp, leaving the victims alone in the dark until they realize they have been tricked and "left holding the bag."

Kids aren't the only ones gullible enough to fall for the ruse. In 2009, a small-town Pennsylvania newspaper told the story of a local sportsmen's club that convinced two new adult members to stand in the woods holding paper bags and flashlights for hours while snipe were supposedly herded their way.

Snipe aren't likely to lose their legendary status any time soon. For most people, a snipe hunt will remain a prank played on the unsuspecting. But the real joke is on those who refuse to believe that the authentic snipe, a bird with musical tail feathers, actually exists.

TINNIES Right: Stamped from sheets of tin and designed for portability, snipe decoys were sold in packs of a dozen each beginning in the late 1870s. Hunters would fold each "tinny" in half and mount it on a stick to attract live snipe to their blinds.

HEAVENLY GOATS? Right: Because people could not discern the source of the snipe's eerie winnowing sound—later found to emanate from air moving through its spread tail feathers and wings—the bird was for centuries considered a mythical creature, such as a heavenly goat or horse. Below right: An adult female moves through marsh muck with its chicks.

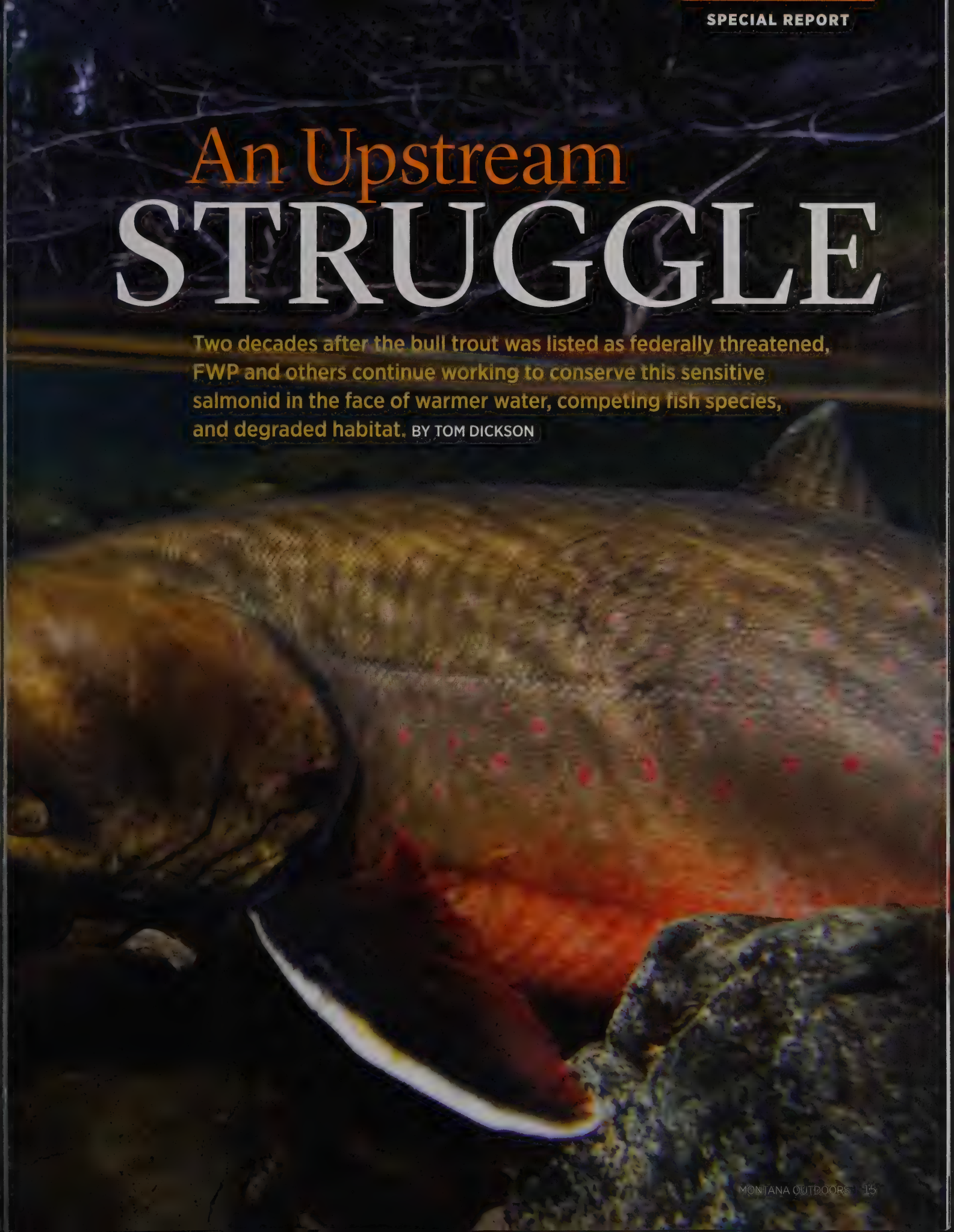
DUPED Above: These good-natured newcomers to the Pequea Valley Sportsmen Association, in Pennsylvania, fell for a snipe "hunt" hook, line, and sinker. Left: Vintage shotgun shell box with snipe loads used for actual hunts.

READY TO REPRODUCE A hook-jawed male bull trout, belly crimson in spawning colors, rests as it moves up a tributary of Lake Koocanusa in northwestern Montana. With cold, clean water and no invasive lake trout, the reservoir is among Montana's most important bull trout fisheries and one of the few waters where the species may be harvested.

PHOTO BY JOE RIDOSARTORE/NATIONAL GEOGRAPHIC AND WADE FREDENBERG/USFWS

An Upstream STRUGGLE

Two decades after the bull trout was listed as federally threatened, FWP and others continue working to conserve this sensitive salmonid in the face of warmer water, competing fish species, and degraded habitat. BY TOM DICKSON



"Over here," whispers Ron Pierce from a patch of alders along a Blackfoot River tributary, roughly 40 miles east of Missoula. He parts the branches and points. A pair of spawning bull trout swim in the tail of a shallow pool. About two feet long, the pale silver fish suspend over pink and powder-blue cobble in water as clear as air. Their dark shadows appear more visible against the creek bottom than the ghostlike fish themselves.

We've been hiking upstream for an hour on an early September afternoon. These are the first bull trout we've found.

The fish swim back and forth in the current, side by side, gently bumping and nipping each other. "They'll stay like this for two or three days until they're done spawning," says Pierce, a Montana Fish, Wildlife & Parks biologist who works in the Blackfoot watershed.

The stream, averaging about 15 feet wide, is ideal bull trout habitat, Pierce tells me. Icy water feeds into it from snowfields in the Swan Range to the north. Downed Engelmann spruce and Douglas fir create pools where fish can escape bald eagles and ospreys. Pierce points to "upwellings"—light spots in the gravel where spring water bubbles up from the stream bottom ("like a gin and tonic"). Cold, oxygenated water is essential for egg survival. "When it comes to cold-water habitat, bull trout require the best of the best," Pierce says.

Unfortunately for bull trout and those who value the large salmonids, Montana contains increasingly less of the best.

Bull trout numbers have steadily decreased over the last century. In recent years, public agencies, hydropower and timber industries, landowners, and conservation groups have tried to stem the decline, spending millions of dollars to protect, conserve, and restore populations. In some cases the work has paid off. Montana is still home to some of the largest and healthiest populations in the West, and the species swims in 98 percent of the waters it did when listed as federally threatened in 1998. Bull trout conservation projects have also protected wild places and clean, cold waters where west-slope cutthroat and other trout live.

Yet restoring Montana's bull trout numbers back to where they were even two decades ago remains highly unlikely. "It's definitely frustrating," says Lee Nelson, an FWP native fish species coordinator in Helena. "We value bull trout as much as anyone. But large and complex factors challenge our ability to recover them to anywhere near where they once were."

Tom Dickson is editor of Montana Outdoors.

"ENEMY OF GAME FISH"

Regularly reaching 10 to 15 pounds and occasionally surpassing 20 pounds, bull trout are a type of trout known as char. They are close cousins to lake trout, which are native only to a few Montana waters, and brook trout, non-natives that were widely stocked in western Montana in the early 20th century. Bull trout have pale spots, white-edged fins, and, like some salmon, bellies that turn crimson red when spawning.

It was during spawning season—late August through October—that native Salish and Pend d'Oreille people, for millennia, captured adult bull trout with willow traps and rock weirs. The large fish were eaten fresh or dried for later consumption, providing essential protein in mountainous areas that contained far fewer elk, deer, and bison than the prairies to the east.

For the most part, settlers of European heritage disparaged bull trout. Though some anglers pursued "the poor man's salmon" with stout spinning rods and wooden plugs, most despised them. Newspapers published photos of the voracious fish (then called Dolly Vardens, a name that now refers to a smaller, separate sea-run species found almost entirely in coastal British Columbia and Alaska), with bellies cut open to show dozens of newly stocked non-native brown, brook, or rainbow trout. A 1932 issue of the Department of Fish and Game magazine *Montana Wild Life* dubbed bull trout "an enemy of game fish." For years, Montana offered bounties on bulls

AGE-OLD PURSUIT Left: In this undated photo, a Kootenai angler fishes from a leather canoe in northwestern Montana. For thousands of years, indigenous people relied on bull trout for protein, eating the fish fresh or drying it for later. Right: Bull trout hold in the cold, clean water of the Middle Fork of the Flathead River near Essex, along the southern border of Glacier National Park.

and encouraged their eradication. One magazine article recommended pitchforks.

Public attitudes toward bull trout began to shift in the 1960s and '70s with the rise of environmental awareness, increased interest in native fish, and documented population declines. Biologists began to learn that the aggressive predator is surprisingly sensitive, requiring complicated, specialized habitats. Foremost are the "Four Cs": water that's cold, clean, connected, and complex (a mix of deep holes, overhanging banks, and downed trees that create hiding areas). Bull trout soon became a symbol of pristine wilderness.

Like salmon and steelhead, bull trout spawn in forested headwaters, where dense conifer stands shade streams and hold snowpack that trickles ice water into creeks during the summer. At age two to four, most bull trout either head downstream to large rivers like the Blackfoot or Clark Fork (known as fluvial populations) or lakes such as Flathead and Swan (adfluvial populations). At age five to seven, adult bulls head back up to spawn in the natal waters where they hatched.

Barriers to these long upstream and downstream migrations are many and troublesome, ranging from hydropower dams on the lower Clark Fork to the numerous small "perched" culverts scattered across national forests. The downstream ends of these metal structures, which divert streams under logging roads, often perch a foot or more aboveground, creating tiny waterfalls that bull trout can't pass. "Bull trout need to migrate, sometimes more than 100 miles, as part of their life history," says Matt Boyer, FWP fisheries biologist in Kalispell. "Anything that breaks the connectivity causes problems."

> "When it comes to coldwater habitat, bull trout require the best of the best."

Maintaining connectivity is less an issue for populations of smaller (growing no larger than 15 inches long) and less common "resident" bull trout, which live their entire lives in tributaries without migrating.

MAJOR THREATS

Scientists have learned that, in addition to migration blockage, bull trout face three other major threats: silt, warm water, and competing non-native fish species.

Silt smothers and suffocates bull trout eggs and clogs upwellings and gravel where eggs nestle for incubation. It washes into streams from logging roads, clear-cut hillsides, mining operations, plowed crop fields, and banks trampled by cattle. "We're still seeing historic logging roads in headwaters washing out and contributing pulses of sediment 40 or 50 years after they were built," says Ladd Knotek, FWP fisheries biologist in Missoula.

Bull trout put the "cold" in coldwater fish species. Adults can tolerate water up to 65 degrees, but young bulls can't survive temperatures above 60 degrees and prefer a chilly 50 to 55 degrees. Such frigid waters are becoming rarer each year. Over the past half-century, snowpack in much of western Montana has declined by 40 percent. As global temperatures rise, remaining snowfields melt earlier, depriving bull trout of snowmelt that cools streams in late summer.

Montana streams also warm when housing construction and other development removes shady tree and brush cover. Temperatures also increase when streams are "de-watered" by irrigators, sometimes

RECONNECTED Above and below: A major threat to bull trout are dams that block up- and downstream migrations. In 2010 FWP removed the Emily-A Dam on the Clearwater River, creating access to key spawning tributaries.

leaving adult bull trout stranded in shallow pools. The lack of cold water is especially dire in west-central Montana (FWP's Region 2), the southern part of the bull trout's historic range. "We're always saying, 'These streams need ice cubes,'" says Pat Saffel, FWP regional fisheries manager in Missoula.

Though streams and lakes remain plenty cold in northwestern Montana (Region 1), "the big problem here is non-native fish," says Leo Rosenthal, a fisheries biologist in Kalispell. Historically, these waters contained only a few species: westslope cutthroat trout, sculpins, and bull trout. Then state and federal agencies in the early 20th century, and lawbreakers in recent years, introduced more than a dozen non-natives, many that harm bull trout populations. In headwater streams, brook trout reproduce more readily and crowd out young bull trout. Brookies also hybridize with the closely related natives, creating genetically impure hybrids. In lakes, the biggest threat is another large, predaceous salmonid that, with the help of a tiny crustacean, has taken a big bite out of bull trout populations.

A SHRIMP AND A MONSTER

At nearly 124,000 acres, Flathead Lake is the largest natural freshwater lake west of the Mississippi. For thousands of years, bull trout were the largest fish that swam in its waters. Each year in late summer, monster bulls, some topping 20 pounds, made spawning runs up tributaries of the North, Middle, and South Forks of the Flathead River, which flow into the lake from the pristine forests of the Bob Marshall Wilderness and Glacier National Park regions.

In 1905, the U.S. Fish & Wildlife Service introduced lake trout into Flathead to boost recreational fishing opportunities. Later the state stocked kokanee, a landlocked salmon. Bull trout, lake trout, and kokanee numbers remained steady for several decades. In the late 1960s and early '70s, FWP planted tiny *Mysis* (opossum) shrimp in three lakes in the upper Flathead watershed to boost kokanee size. The shrimp made their way downstream to Flathead Lake and fueled a lake trout explosion in the 1980s and '90s. Young lakers now had access to an abundant food source and quickly overwhelmed the system. The growing number of subsequent adult lake trout fed heavily on kokanee and young bulls. The kokanee population was decimated, and the bull trout population took a nosedive.

LITTLE CRUSTACEAN, BIG PROBLEM
After escaping into Flathead and Swan Lakes following their introduction upstream, *Mysis* shrimp disrupted the lake ecosystems, causing bull trout numbers to crash.

Fishing tournaments and sport angling remove roughly 70,000 lake trout from Flathead Lake each year. The harvest hardly dents the population, today estimated at 1.6 million. Meanwhile, the adult bull trout population in Flathead and its major tributaries has dropped to fewer than 5,000, though numbers have stabilized over the past decade.

The Confederated Salish and Kootenai Tribes (CSKT) have begun commercial netting on the lake's southern half, in the Flathead Reservation, to remove lake trout. The bull trout has cultural significance for the region's Native Americans. "Letting [bull trout] wink out on our watch...would be morally bankrupt," Tom McDonald, head of the tribes' Fish and Wildlife Division, told *High Country News*. Recreational anglers are split over the idea of industrial-scale netting. Many enjoy fishing for trophy lake trout—which sustains a $20 million recreational fishery in the area—while Trout Unlimited (TU) and the U.S. Fish & Wildlife Service (USFWS) support more aggressive removal and urge

Needs and nots

Bull trout require the "Four Cs": cold, clean, complex, and connected water. Conversely, warm water, siltation, competition from non-native fish, and migration barriers all pose threats.

COLD

Adult bull trout can tolerate warmer water up to 65 degrees, but younger fish can't survive temperatures above 60 degrees and prefer a chilly 50 to 55 degrees.

CLEAN

Bull trout require clean waters and are highly vulnerable to siltation, acid mine drainage, and other forms of water pollution.

COMPLEX

Bull trout streams and rivers need deep holes, overhanging banks, and woody cover where the big fish can hide from otters, bald eagles, and other predators.

CONNECTED

Most adult bull trout live in large lakes and rivers but need to swim far up tributaries to spawn. Adults and juveniles need to move downstream to the big waters.

WARM WATER

The combination of climate change and streamside vegetation removal is warming many streams in west-central Montana to temperatures well above what young bull trout need to survive.

SILT

Silt from old logging roads smothers and suffocates bull trout eggs and clogs upwellings and gravel where eggs need to nestle for incubation.

NON-NATIVE FISH

The biggest threats to bull trout in northwestern Montana are brook trout in tributaries and lake trout in lakes.

MIGRATION BARRIERS

Dams, "perched" culverts, and anything else blocking up- or downstream migration harms bull trout populations.

CLOCKWISE FROM LEFT: ILLUSTRATION BY JOSEPH TOMELLERI; WIKIPEDIA; USFWS; TOM BAUER/*MISSOULIAN*

FWP to net lake trout in the northern half, which is managed by the state.

"We're in agreement with the tribes, TU, and the USFWS on nearly every issue related to bull trout conservation in the Flathead drainage, just not with lake trout netting," Nelson, the FWP native fish species coordinator, says. The department maintains that as long as *Mysis* remain in Flathead Lake and support the lake trout population, FWP should invest anglers' license dollars and other funds in protecting and restoring upstream habitat and other projects that sustain not just bull trout but the overall environment.

> "We wish there was some magic solution [on Swan Lake] that was cost effective and sustainable."

ANOTHER INFESTATION

A non-native fish invasion of 3,200-acre Swan Lake has overwhelmed its bull trout population, too. Starting in the late 1990s, anglers reported catching lake trout—which likely migrated up the Swan River from Flathead Lake into Swan Lake, which contains *Mysis*. Concerned that the shrimp-fueled invaders would crowd out bull trout as they did on Flathead, a working group that includes FWP, Montana Department of Natural Resources and Conservation, Trout Unlimited, CSKT, Montana State University, and federal agencies contracted with a commercial fishing company to use targeted netting to remove lake trout. From 2009 to 2016, crews harvested more than 60,000 lakers. It didn't help much.

The lake trout population has held steady while bull trout numbers declined by half before leveling off. Though other working group partners want FWP to continue netting, the department has suspended the operation. "We wish there was some magic solution that was cost effective and sustainable," says Rosenthal. "But the level of suppression we tried didn't produce the results we'd hoped for." Until the working group comes up with a well-funded, science-based management program that FWP agrees will benefit Swan Lake's bull trout, he adds, "we're focusing instead on increased monitoring and research to inform future management decisions."

USFWS and FWP see eye to eye on bull trout (most of the time)

Wade Fredenberg grew up in Kalispell and remembers his uncle and others fishing for migratory bulls on the Flathead River. "Back in the 1960s, they were still a big part of the fishing scene up here," says the recently retired fisheries biologist.

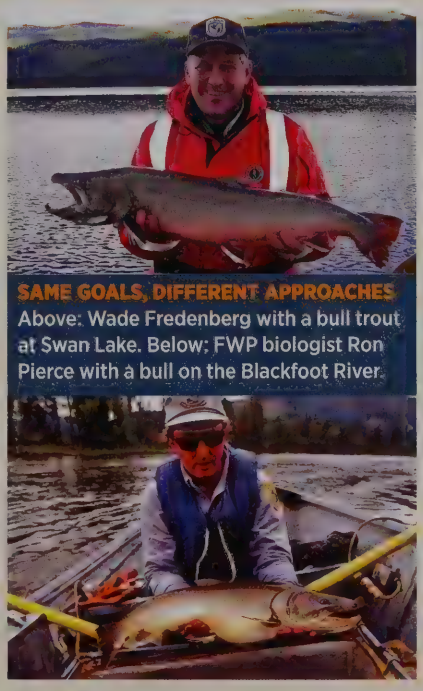
So it's been especially tough for Fredenberg to see numbers of the big fish decline over the past 25 years. "The handwriting is pretty clear," says the former U.S. Fish & Wildlife Service regional bull trout coordinator. "We're losing bull trout."

The good news, according to Fredenberg, is that bull trout still swim in almost all of the same waters they did a century ago. "But instead of hundreds or thousands of fish in many of those tributaries, in some cases there are now just a few dozen," he says.

In 2015, the USFWS issued a revised bull trout recovery plan. The document identifies "historical habitat loss and fragmentation, interaction with non-native species, and fish passage issues...as the most significant [threats] affecting bull trout."

FWP officials concur. "We see eye to eye with the Service 90 percent of the time and recognize our partnership with them as essential in bull trout recovery," says Eileen Ryce, head of the FWP Fisheries Division.

However, the Service and FWP part company over how to respond to specific threats, especially non-native species. The federal agency wants Montana to remove non-natives from some bull trout streams and Flathead and Swan Lakes. FWP officials agree that certain removal efforts, like eliminating brook trout in headwaters, can benefit bull trout. But others, like trying to net lake trout in massive lakes, have not worked. "If we can't prove that something will help, it's hard to make the case that it's worth spending angler license dollars on it," says Pat Saffel, regional FWP fisheries manager in Missoula.



SAME GOALS, DIFFERENT APPROACHES
Above: Wade Fredenberg with a bull trout at Swan Lake. Below: FWP biologist Ron Pierce with a bull on the Blackfoot River.

Fredenberg points to conservation easements and diversion dam screening as examples of interagency cooperation. "In the Blackfoot and elsewhere, there have been systematic improvements to bull trout habitat in key areas," he says. Another area of cooperation: research. "We have a far greater understanding of what these fish are and what they need," Fredenberg says.

Fredenberg, who worked for FWP before moving to the federal agency a quarter-century ago, says he continues to maintain good relations with his colleagues. "We all care about bull trout and want them to succeed," he says. "But our two agencies have different mandates, and that can lead to different opinions about the best ways to achieve success." ■

"We all care about bull trout, but our two agencies have different mandates, and that can lead to different opinions."

SUCCESS STORIES

Despite the setbacks, FWP and its partners can point to many bull trout conservation gains. "The species would be in much worse shape without all the work our crews and partners have done over the past 20 years," Nelson says.

Federal and state logging and road construction in mountainous areas now routinely retain trees and other vegetation in riparian corridors and prevent silt from reaching streams. To protect individual bull trout, FWP ended almost all harvest and even most recreational fishing for the species. The department also teamed up with Trout Unlimited to educate anglers on bull trout threats and how to distinguish young bulls from other species so the threatened fish aren't accidentally kept for the frying pan.

Throughout western Montana, biologists work with area ranchers to improve tributary habitat. Teams have restored streamside vegetation, narrowed shallow areas, and installed screens to prevent bull trout from swimming into irrigation ditches. "One day I showed a ranch manager where his cattle were wading right through some spawning redds, and he looked at me and said, 'Okay, we need a fence here,'" Pierce says.

FWP works with the U.S. Forest Service to regrade and revegetate old logging roads, and to enlarge culverts to prevent remaining roads from washing out after heavy rains and snowmelt. The department also has purchased key tracts containing critical bull trout spawning and rearing habitat, such as Marshall Creek Wildlife Management Area (WMA) in the Seeley-Swan Valley and Fish Creek WMA south of Superior.

For the lower Clark Fork's migratory bull trout, Avista crews capture adults below Cabinet Gorge Dam and truck them upstream. After DNA analysis, each captured fish is delivered to its natal water, increasing the odds of spawning success. To protect downstream-moving bull trout from non-native predators, dam turbines, and warm water, crews transport the fish around the structures so they can grow and mature in Idaho's Lake Pend Oreille. FWP also works with the power companies to protect and restore habitat in tributaries where the migratory fish spawn and rear.

> "We get excited about taking out a culvert or screening a diversion ditch. To see habitat restoration at such a large geographic scale is mind boggling."

A fish ladder at NorthWestern Energy's Thompson Falls Dam allows bull trout to move past that structure.

RESTORING PASSAGE

On the Clearwater River, a major bull trout stronghold, FWP took out the 1950s-era Emily-A Dam, which blocked the native fish from key spawning tributaries. "After removal in 2010, we saw bull trout spawner numbers in the West Fork Clearwater more than double," says Knotek, the FWP biologist in Missoula. "If an ecosystem is still intact, we can do a lot to help bull trout just by restoring connectivity."

Another major connectivity restoration came in 2008 with removal of Milltown Dam. The dam was built a century earlier at the confluence of the Clark Fork and Blackfoot Rivers, a sacred site known to the Salish-Pend d'Oreille as *Nayccstm* (Place of the Big Bull Trout). The dam removal, done in part because FWP researchers proved the structure harmed federally protected bull trout populations, opens up 140-plus miles of spawning tributaries. "We get excited about taking out a culvert or screening a diversion ditch," says Saffel, the regional manager. "To see habitat restoration at such a large geographic scale is mind boggling."

At the same time, FWP biologists have been closely studying the bull trout's complex life history. They implant bulls with tiny transmitters then follow the fish with radiotelemetry from headwater streams no wider than a doorway downstream to sprawling rivers, lakes, and reservoirs. Breakthroughs in DNA science have allowed scientists to more precisely understand how populations function and interact.

TREE DWELLER An adult bull trout in the Blackfoot River finds safety under a fallen tree. Hiding areas and deep holes created by woody debris like this are critical for bull trout survival.

A breakthrough study done in the 1990s showed the different habitat that bull trout need in every life stage. It detailed the ways mining, logging, livestock grazing, dams, roads, and other human development can damage the places where bull trout live. "We know a lot about bull trout life history and what harms the habitat," says Tom Weaver, an FWP biologist who co-authored the report and has studied bull trout for 30 years. "But doing something about those impacts is a whole different story."

RIVER FISHING OPPORTUNITIES?

Several years ago while fishing the Bull River in southern British Columbia, I caught a 31-inch bull trout. The cream-colored giant lived most of its adult life in Lake Koocanusa, which straddles the international border and into which the Bull River flows. About an hour after releasing the fish, I was back in Montana, heading home to Helena.

Though bull trout are showing up more frequently in the Blackfoot and a few other Montana waters, anglers can legally fish for the species only on Hungry Horse Reservoir, Lake Koocanusa, Swan Lake, and the South Fork of the Flathead, a wilderness river that requires a multiday backpacking trip. Will the state ever again offer accessible bull trout river fishing opportunities like I'd experienced in British Columbia, just a short drive north of the border?

Probably not, says Nelson. The combination of broken connectivity, warming water, siltation, and non-native fish continues to thwart recovery. "We will protect them in remnant areas, and our grandkids will more than likely be able to fish for bull trout in Koocanusa, Hungry Horse, Swan, and the South Fork of the Flathead," Nelson says. Yet as long as *Mysis* shrimp and lake trout remain in Flathead and Swan Lakes, brook trout reside in headwater streams, and water temperatures continue to warm, any conservation gains will be local and small in scale. "We're by no means giving up. We'll continue doing all we can to keep bull trout around far into the future," says Nelson. "But the dream of having them running up and down the Clark Fork, Bitterroot, or mainstem Flathead like they were 100 years ago—that's just not realistic."

Leave those bulls alone, say FWP fisheries biologists

ETHICAL DILEMMA An angler releases a 19-inch bull trout from the South Fork of the Flathead, the only river in Montana where anglers may fish for the species (angling is legal also on Hungry Horse Reservoir, Lake Koocanusa, and Swan Lake). On the Blackfoot River and North Fork of the Flathead River, anglers are increasingly targeting—illegally—bull trout, wrongly assuming that they are not harming the highly stressed fish.

The stories and YouTube videos are becoming more frequent: While an angler reels in an eight-inch cutthroat on the Blackfoot River or North Fork of the Flathead, a big bull trout rushes up out of the depths and grabs the smaller fish, then won't let go.

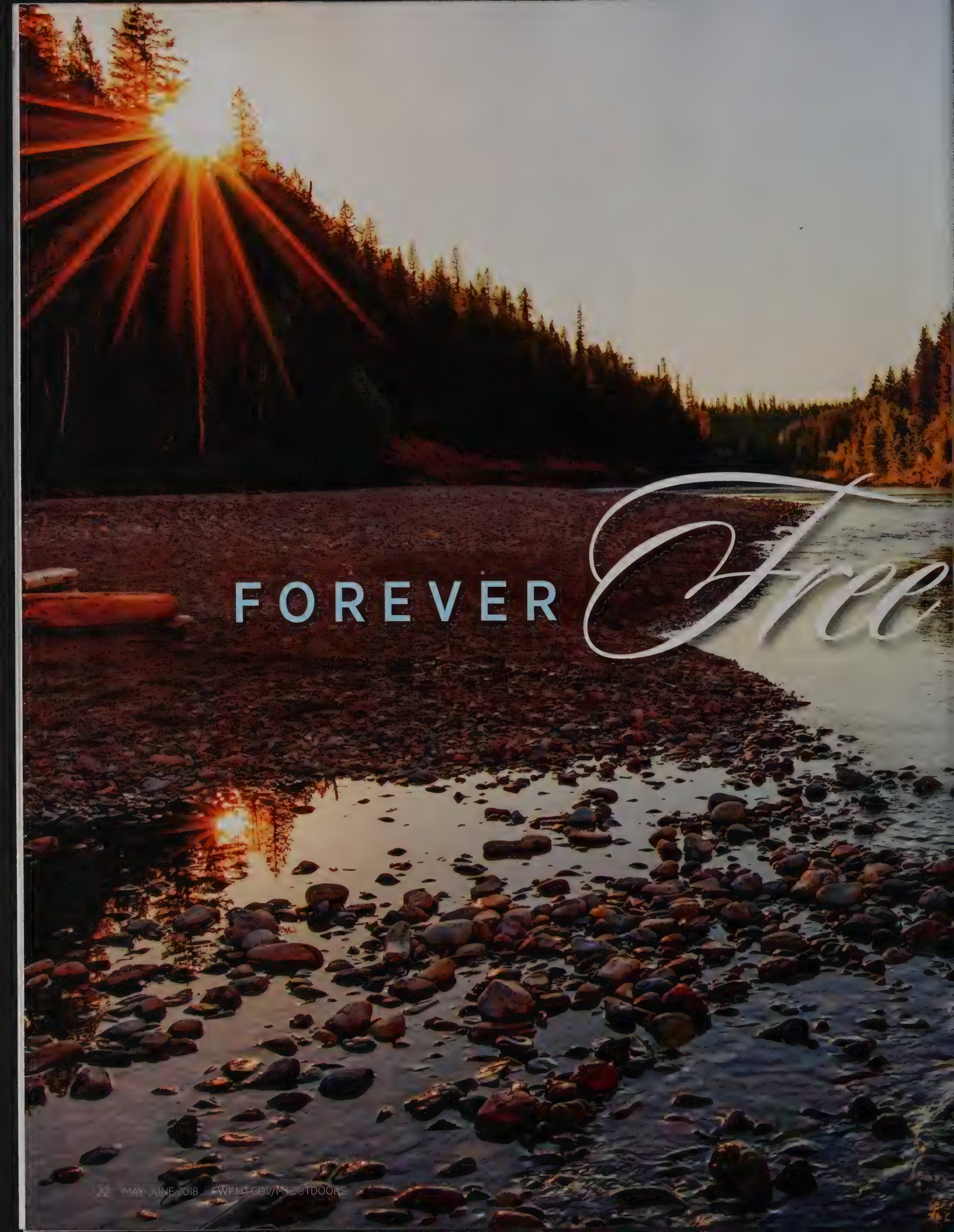
Anglers wonder: If, as it seems, bull trout numbers are increasing, why is it still illegal to fish for them in all but four waters?

Anglers
you are in
Bull Trout Country!
Be sure you can identify them. They may not be kept and possession can result in a $200.00 fine.
If you don't know, be safe and let it go!

It's true that populations in some rivers are growing. But in much of the species' range, numbers have dropped so low that angling threatens vulnerable spawning adults that carry future bull trout generations. "We know that some anglers and even outfitters are targeting these trout, likely assuming they aren't doing any harm because they release the fish," says Ladd Knotek, FWP fisheries biologist in Missoula.

The practice could hurt bull trout. "Big bulls are so aggressive they can get caught easily and in predictable locations," Knotek says. "They're in there preparing to spawn, trying to conserve energy in water temperatures approaching their limit for survival. The last thing they need is to be hooked and dragged around the water again and again. Anglers who care about bull trout need to leave bull trout alone."

CLOCKWISE FROM LEFT: BILL MCDAVID, LIZ JUERS, WIKIPEDIA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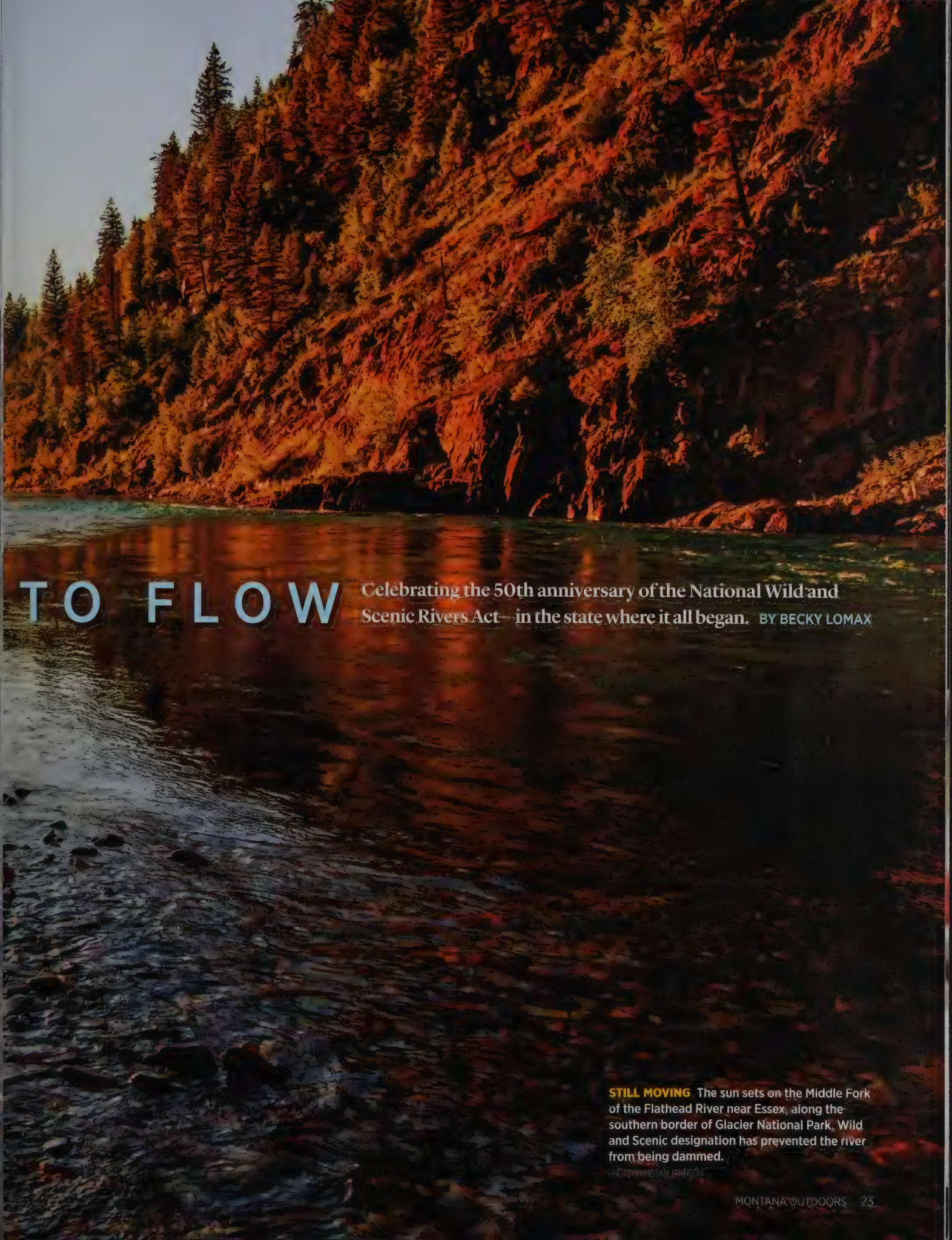


TO FLOW

Celebrating the 50th anniversary of the National Wild and Scenic Rivers Act—in the state where it all began. BY BECKY LOMAX

STILL MOVING The sun sets on the Middle Fork of the Flathead River near Essex, along the southern border of Glacier National Park. Wild and Scenic designation has prevented the river from being dammed.

PHOTO BY MEGAN JOHNSON

In three turbulent drops, whitewater slices through Spruce Park Canyon in the Great Bear Wilderness. At high water in late June, the upper Middle Fork of the Flathead River roars with savage hydraulics through lurking boulders burly enough to upend a rubber raft and send its paddlers flying.

The Spruce Park Canyon Class IV rapids, about 20 miles south of Glacier National Park, are renowned among big-water rafters. Commercial operators take visitors down Montana's closest equivalent to Idaho's Salmon River on multiday trips through the stunning scenery of pristine mountain wilderness that remains relatively untouched by humans.

Yet if not for twin brothers who later became famous for their grizzly bear research, this wild stretch of river might instead be only a dry, rocky channel.

The upper Middle Fork's survival is a legacy of the National Wild and Scenic Rivers Act, which celebrates its 50th anniversary this year. "No other country on Earth has a law that permanently protects rivers in their free-flowing condition," says Scott Bosse, Northern Rockies director of the conservation group American Rivers, in Bozeman. "The real testament to just how much Montanans and others value their rivers is shown by their support of this federal legislation that proactively identifies and protects these aquatic resources before they are threatened by development."

BIRTH OF RIVER PROTECTION

Montana became the birthplace of the National Wild and Scenic Rivers concept almost by accident. In the late 1950s, the Army Corps of Engineers proposed building a 405-foot-high dam on the upper Middle Fork. At the time, Frank and John Craighead were conducting survival training on western whitewater rivers for the federal government. They visited Spruce Park and recognized the impending threat the proposed project posed to native westslope cutthroat trout as well as wildlife migration routes and habitat. The Corps's plan was to dam the river then divert it down a 12-mile-long underground tunnel to a power-generating facility at Hungry Horse Reservoir. For the rest of its length downstream from the

HERE WE GO! Cutting through the Great Bear Wilderness, the upper South Fork of the Flathead is run by experienced solo rafters and thrill-seeking tourists guided by expert commercial operators.

proposed Spruce Park Dam, the Middle Fork would be reduced to a trickle. The South Fork of the Flathead had already been dammed in 1953, and hydropower developers also had their eyes on the North Fork, which flows from Canada along Glacier's western boundary.

For years, conservationists and congressional leaders in Washington, D.C. had been discussing the need for federal wilderness protection. The Craigheads agreed, but believed that wilderness proposals wouldn't protect wildlife habitat along river corridors at lower elevations, such as the Middle Fork. In 1959, the year the brothers began their famous study of grizzly bears in Yellowstone National Park, they wrote a widely distributed article for *Naturalist* magazine proposing a classification system that would designate rivers as wild, semiwild, semiharnessed, and harnessed. Classification, the brothers reasoned, would allow people to see just how scarce wild rivers truly were and how their protection was linked to that of wilderness lands. "Rivers and their watersheds are inseparable, and to maintain wild areas we must preserve the rivers that drain them," they wrote.

WILD AND SCENIC RIVERS ACT

Four years after enacting the Wilderness Act, Congress passed the National Wild and Scenic Rivers Act in 1968. Congressional leaders of the effort included Montana's Senator Lee Metcalf and Idaho's Senator Frank Church. The legislation protects designated rivers from dams and other development that would change their beautiful or untamed nature—protections the Wilderness Act had not secured. Designation does not affect private property rights.

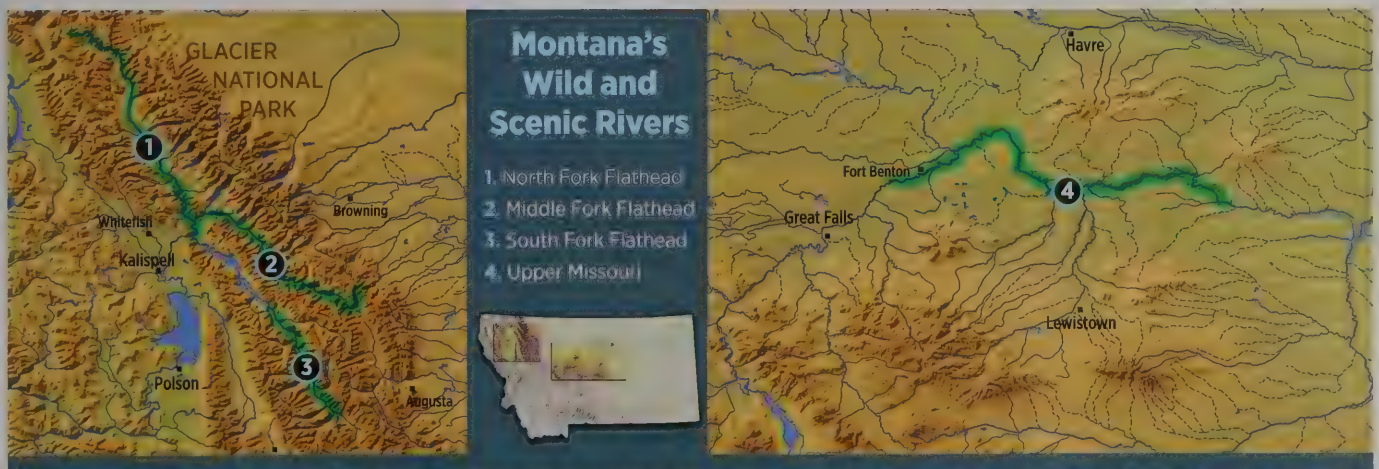
Ironically, the original version didn't include the three forks of the Flathead or any other Montana rivers, which continued to be threatened by commercial interests promoting hydropower dams. Finally, in 1976, passage of the Omnibus Wild and Scenic Rivers Act designated the three forks and the Upper Missouri between Fort Benton and Fort Peck Reservoir as Wild and Scenic Rivers. No Montana rivers have received this designation since.

Those four Montana rivers are among a total of 208 designated rivers nationwide, most managed by the U.S. Forest Service. Protections maintain their clean water and free-flowing nature. "Once a river is designated as Wild and Scenic, we no longer have to fight the same battles against proposed mines, dams, and other threats over and over again," Bosse says. Most recently in Montana, the Wild and Scenic River status of the North Fork of the Flathead was used as international leverage by Senator Jon Tester and others in negotiating against future mining and energy development in the river's headwaters in British Columbia.

> "In spite of the durability of rock-walled canyons and the surging power of cataracting water, the wild river is a fragile thing—the most fragile portion of the wilderness country."
>
> —JOHN CRAIGHEAD

RIVER GUARDIANS Above: John (left) and Frank Craighead on the Idaho River in 1970. Below: President Lyndon B. Johnson signs the National Wild and Scenic Rivers Act into law on October 2, 1968.

Longtime Montana Outdoors *contributor Becky Lomax lives in Whitefish.*



A HANDFUL OF RIVERS In total, 368 miles of Montana's rivers have been designated as Wild and Scenic Rivers, roughly two-tenths of 1 percent of the state's total. The North Fork of the Flathead is subdesignated as Scenic; the upper South and North Forks of the Flathead are subdesignated as Wild, and the Upper Missouri River—famous for its White Cliffs stretch—is subdesignated as Recreational, as are the lower stretches of the other three.

LEFT TO RIGHT: NICK FUCCI; CRAIGHEAD FAMILY PHOTO; NATIONAL ARCHIVES. MAP BY LUKE DURAN/*MONTANA OUTDOORS*

REST AREA Under a fiery sky, floaters make camp on the Missouri River near Hole in the Wall on the White Cliffs, made famous by Lewis and Clark.
PHOTO BY ROLAND TAYLOR

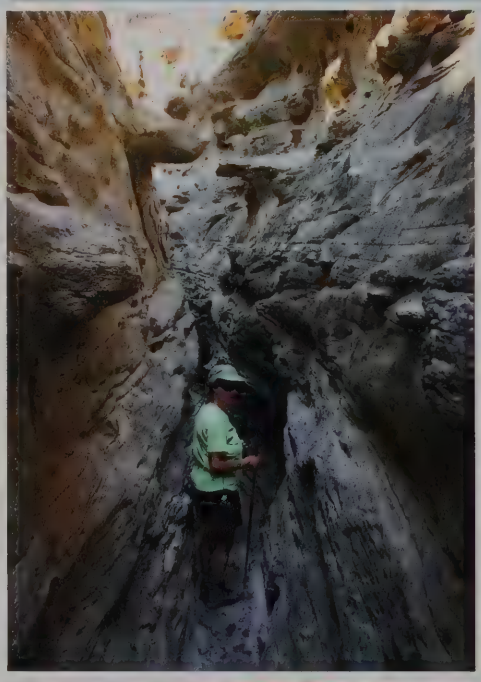
In total, 368 miles of Montana's rivers gained recognition as Wild and Scenic Rivers, roughly two-tenths of 1 percent of the state's 170,000 total river miles. The rivers are subclassified as Wild, Scenic, or Recreational, according to the extent to which they have been developed. They are used for floating, angling, scenery appreciation, camping, and wildlife watching. Licensed guide companies lead whitewater, scenic, and fishing float trips on all four.

MONTANA'S WILD RIVERS

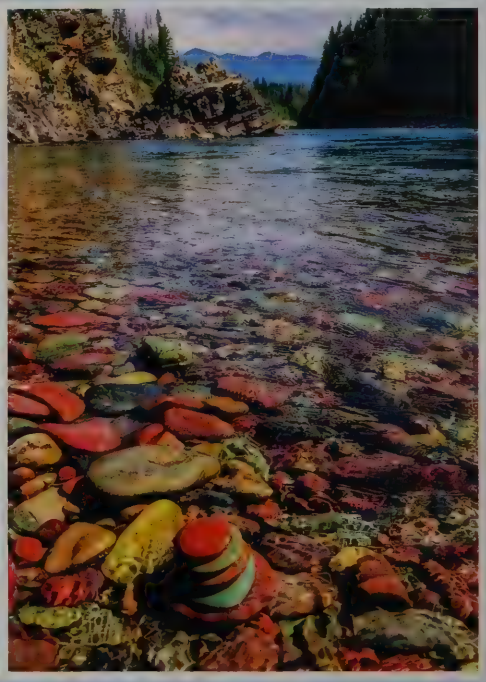
Two of these Montana rivers are subclassified as Wild, which means they must remain primitive, roadless, and unpolluted. Cutting through upthrust rock slabs in the Great Bear Wilderness, the upper Middle Fork of the Flathead churns up several miles of thrilling (though potentially dangerous) whitewater. Class IV rapids punctuate this remote river that amps up to dangerous Class V water during runoff in Spruce Park Canyon. A steady string of raft-flipping

holes make this stretch popular with skilled solo rafters and thrill-seeking tourists who consign their fate to the calloused hands of experienced guides.

The South Fork of the Flathead is a much tamer river that rambles north through the Bob Marshall Wilderness into Hungry Horse Reservoir. Shallow riffles alternate with sapphire-blue and emerald-green pools containing native mountain whitefish, westslope cutthroat trout, and bull trout. In fact, the South Fork is the only river in Montana where anglers can fish for the federally threatened bull trout. "The Wild and Scenic River designation preserves the natural river corridor, which in turn provides a measure of protection for the fishery," says Matt Boyer, FWP regional fisheries science program supervisor in Kalispell. "With no land use or development along the river's edge, plus limited road access, the South Fork offers more opportunities for solitude to enhance the angler's experience."



WILD RIDE Clockwise from top: Canoeing the North Fork of the Flathead River; colorful rocks in the Middle Fork of the Flathead River near Blankenship Bridge; sandstone formations on the Upper Missouri River near Big Sandy; sunrise at Coal Banks Landing on the Upper Missouri River; exploring the White Cliffs of the Upper Missouri River; the South Fork of the Flathead River above Hungry Horse Reservoir.



CLOCKWISE FROM TOP: NELSON KENTER; LINDA MARTIN; STEVEN AKRE; JIM CADY; SUMO HARADA; JOHN LAMBING

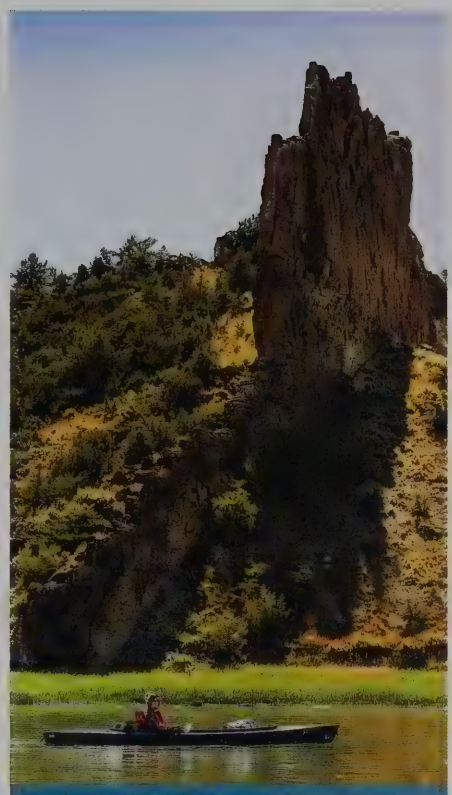
SCENIC AND RECREATIONAL

From the Canada border, the North Fork of the Flathead saunters through wolf, moose, and grizzly bear habitat below Glacier National Park's rugged peaks. The upper stretch is Montana's only river subdesignated as Scenic, with a mostly primitive and undeveloped shoreline. Peppered with logjams and braided channels, the river putters along with small rapids, making for lazy-day paddling in canoes, kayaks, and rafts. These waters are also plied by driftboats carrying anglers casting dries or drifting nymphs for westslope cutthroat trout.

All three forks of the Flathead are designated as Recreational in their lower stretches. Due to easier road access, FWP fishing access sites here are packed on summer weekends. Rafters and kayakers tackle the occasional whitewater, canoeists and paddleboarders float flat water, and anglers drift slowly over deep holes.

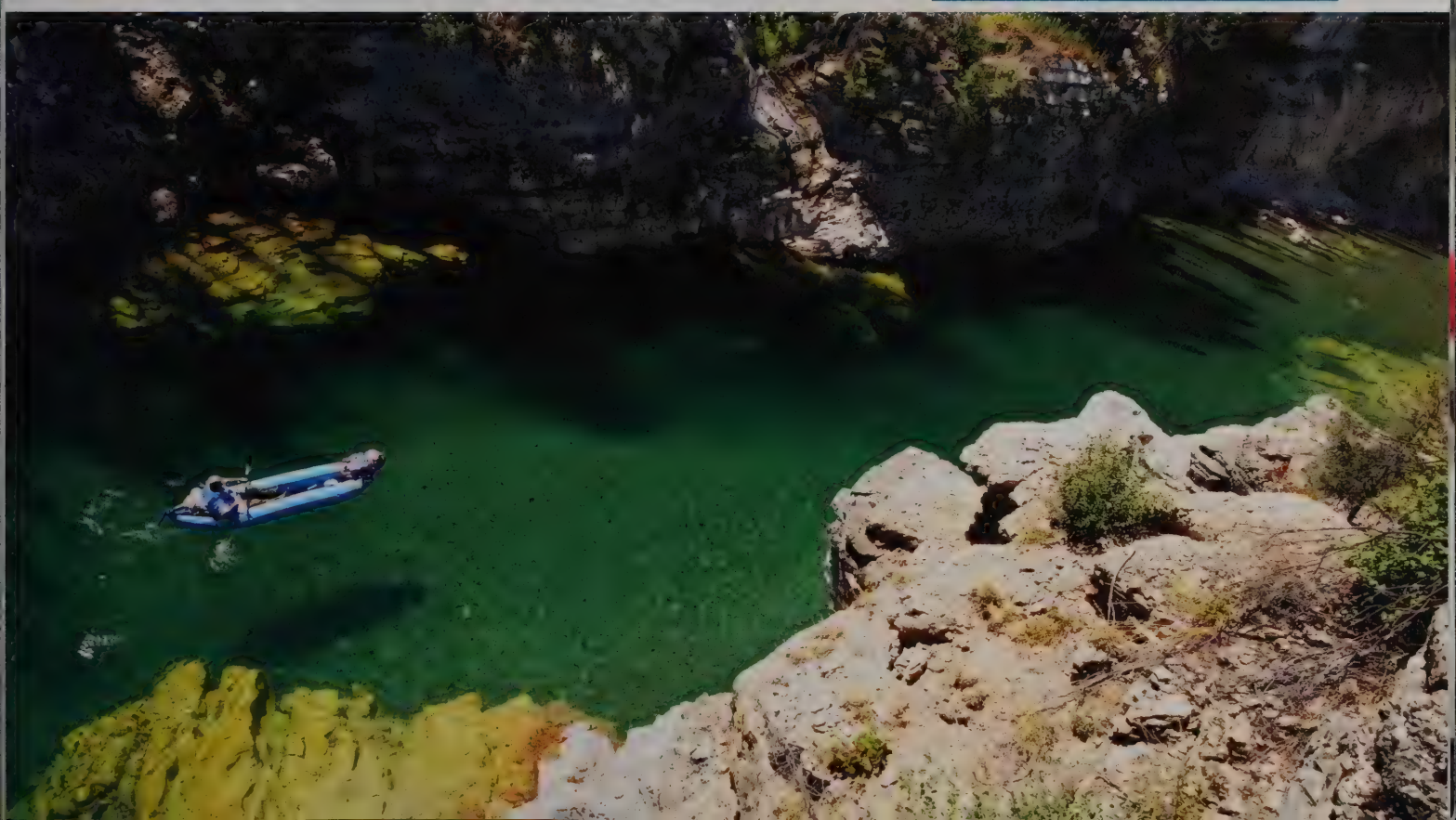
East of the Continental Divide, the Upper Missouri River slices through sage-scented prairie and the weather-beaten White Cliffs of the Missouri Breaks. Squadrons of American white pelicans soar along this ancient aquatic highway, first used by Native Americans, later by the Corps of Discovery, and then by flotillas of commercial steamboats. These days, the river is run by all manner of watercraft—rubber rafts, canoes, sea kayaks, motorboats, and even motorized party barges. Starting in spring, amid a cacophony of songbirds, they make their way along the scenic stretch, made famous by Lewis and Clark and the late Helena author Stephen Ambrose's *Undaunted Courage*. The muddy water provides good fishing for channel catfish, freshwater drum, and the occasional shovelnose sturgeon. Each fall, the river is used as a travel route by deer and elk hunters looking for big game on adjacent Bureau of Land Management tracts.

There's no lack of ways to spend a summer weekend or week in Montana. But this year, on the 50th anniversary of the National Wild and Scenic Rivers Act, a trip down one (or more) of Montana's four designated waters seems especially appropriate.

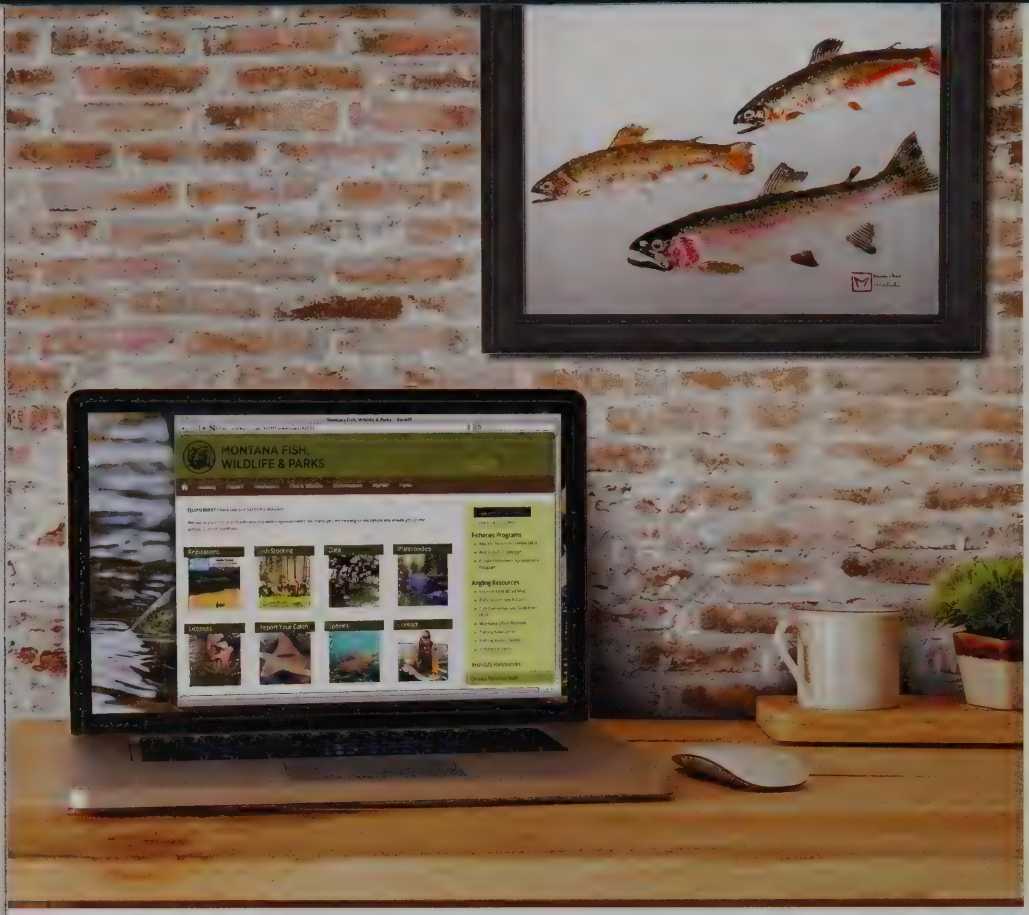


MERIWETHER WAS HERE Above: Cruising past the Grand Natural Wall. The volcanic dike is a prominent landmark on the White Cliffs of the Upper Missouri River. Below: Floating the Middle Fork of the Flathead River.

A bipartisan bill to designate 20 miles of East Rosebud Creek, southwest of Billings, as a Wild and Scenic River unanimously passed the U.S. Senate in December 2017 and may come before the House later this year.



TOP TO BOTTOM: ERIC HEIDLE; ERIK ARGOTTI



ONE-STOP SHOP

The new FishMT web application provides everything FWP knows about Montana's fish and fisheries in a single, easy-to-use online location. **BY TOM DICKSON**

ANGLERS, SCIENTISTS, students, educators, developers, and others interested in information about the state's fish populations can now access the data at what Montana Fish, Wildlife & Parks is calling a "one-stop shop" for all things fisheries related. Found on the department's website, the new FishMT web application is "as user friendly as we can make it," says Adam Petersen, an FWP computer analyst who worked on the team that created the site.

FWP's website previously provided various fisheries information in two places: the Fishing Guide, aimed at anglers, and MFISH, which contained data for scientists, teachers, developers, and others interested in the nitty-gritty details of fisheries science. "We thought that made sense," says David Schmetterling, head of FWP fisheries research. "But we really had no idea what people actually wanted. We'd never asked."

BLOWN AWAY

So they did. The FishMT team surveyed hundreds of anglers, tribal officials, university students, academics, developers, and others they knew were interested in fisheries information. As an incentive, those who completed the survey were entered into a weekly drawing for a free T-shirt. "We basically framed the questionnaire as, 'We have a lot of information that it seems you want. But what exactly do you want and how do you want it delivered?'" Schmetterling says. "It was all about public transparency and responsiveness."

Adam Strainer, an FWP fisheries technician in Helena, says the team predicted it would receive 150 to 200 completed questionnaires. Instead, they got more than 2,200. "We were just blown away," he says.

The most common comment from survey participants? "Thank you for asking for my opinion."

"People definitely appreciate it when a government agency asks them what they want," Strainer says.

One major finding from the survey is that anglers desire much of the same information that FWP had aimed at academics. "They wanted the scientific stuff and raw data as much as stocking rates, fishing pressure, and fish distribution," Schmetterling says.

Also, when asked where they go for information about Montana's fisheries, 86 percent of respondents said they turned to the FWP website. "It was great to know that most people consider us the authority," says Missy Erving, FWP webmaster. Unfortunately, 60 percent of those respondents said they didn't know FWP provided either the Fishing Guide or MFISH. "They were coming to us but not getting what they needed. That was the bad news," says Erving. "But we knew that we already had most of what they wanted, and because we were upgrading to new technology, we saw a tremendous opportunity to deliver that information more effectively."

TAMING GODZILLA

Through FishMT, anyone can quickly access Montana's centralized fisheries information system (which fisheries biologists call "Godzilla" for its massiveness). "In Godzilla we have tens of thousands of fish surveys going back decades, hundreds of thousands of sampling events, and millions of fish records," Schmetterling says. "Montana has the world's longest-running electrofishing data sets, and you can also access information about the effects of climate change or aquatic invasive species on fisheries."

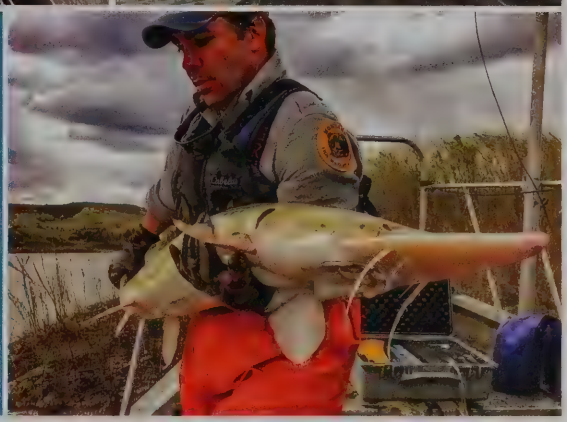
FishMT users can find the information by clicking fields like "Data" or "Stocking," or through what the FishMT team calls the Mega-Map. "You can go into the Mega-Map, start clicking and zooming, and have access to over 20,000 different waterbodies and a thousand access sites for fishing," Petersen says.

Because team members are themselves anglers, they know the types of information their fellow anglers need. "If you're like me,

Tom Dickson is editor of Montana Outdoors.

PHOTO ILLUSTRATION BY MONTANA OUTDOORS

EVERYTHING THEY KNOW
Clockwise from top left: Electrofishing survey data; fish telemetry reports; reservoir seining results; endangered species research; and hatchery stocking records are just part of the fisheries information available through FishMT. The new web application, available on the FWP website, was created to provide anglers, academics, and others with all the scientific and management fisheries information that FWP has acquired over the past century.



CLOCKWISE FROM TOP LEFT: CHRIS MCGOWAN; JOHN WARNER; JESSE LEE VARNADO; TYLER HADDIX; PAUL N. QUENEAU

and you like to explore new areas, this is such a great resource," says Petersen. "You go into the Mega-Map and quickly learn what a stream looks like, what fish are there, how many other anglers you can expect to see, and where the access is."

A MAP APPEARS

Let's say you want to fish the Beaverhead River for the first time. Click on "Waterbodies" and a map appears. Either enter "Beaverhead" in the search screen or just find the Beaverhead River on the Mega-Map, click on the river, and up pops a detailed river map showing locations of each fishing access site, along with links to fish species, survey data, fishing pressure, regulations, and fisheries research reports (some dating to the 1940s). Click on a fishing access site icon to see a photograph of the site, a detailed map, and information about camping and other activities, plus locations of nearby access sites and state parks.

If you're a walleye angler and want information on, say, Fresno Reservoir near Havre, a click on the Mega-Map takes you to pages of detailed stocking data and information on what FWP found in annual fish population surveys. Another bonus: Under "Additional Files," anglers can find detailed bathymetric (depth contour) maps for locating points, drop-offs, holes, and other underwater structures where fish hang out.

> "People definitely appreciate it when a government agency asks them what they want."

If you're a developer, you could use FishMT to see if a river near a proposed housing subdivision contains federally protected species such as bull trout.

If you're a student, instructor, or researcher, the academic possibilities of the web application are nearly endless.

A "Support" button on FishMT lets users ask questions and post comments. "We check it every day," Strainer says. "People are amazed we respond right away."

The FishMT team continues to improve the site with new technology and suggestions offered by anglers and others. This summer, the department will be adding names, contact information, biographies, and photographs of biologists in charge of every fishery across Montana. "We biologists welcome that opportunity for public interaction," Schmetterling says. The team is also working on a mobile app for Montana's fishing regulations.

"We have all this incredible fisheries information, but it's not our data, it's the public's," Schmetterling says. "We want this to be a one-stop shop for getting it to people as easily as possible."

Petersen acknowledges that, even with its vast storehouse of data, FishMT has some limitations. "It can't tell you what insects are hatching on a river, what lure to use, or where the fish are actually located," he says. "But other than that, it's pretty much all here."

Find FishMT at fwp.mt.gov. Look for the tab at the top of the home page.

SOON

This photo essay was born of desperation.

A few months ago, when we hatched the idea, we feared that the winter of 2017-2018 would never end. Governor Steve Bullock had recently declared a state of emergency for parts of Montana hit by a late-season blizzard. Then the snow and cold continued, week after week after week. We began to panic.

It seemed like years since we'd sat on a sunny bank, or waded a stream, or held a fish in our hands. We figured that you, our readers, felt the same way. So we gathered together the best photographs of fishing and fish we could find, to prove to ourselves and

to you that such things do exist. To give us all hope.

When this issue of *Montana Outdoors* went to press in early April, three weeks after the first day of spring, FWP had just closed the Smith River due to ice jams. Residents of Butte were still waking up to lows in the single digits. Snowdrifts along roads into Browning were 10 feet high.

As you read this, we hope that the Long Night is finally over. That snow shovels are stowed away and flip-flops are back in rotation. And that when you finish gazing at these beautiful images of Montana life on and below water, you'll put on some shorts, pick up a rod, and get out there.

Squeeze every drop out of summer. Winter will be back before you know it.

—Editor

An angler selects a fly at Hebgen Lake.
JOHN JURACEK

Left: A Yellowstone cutthroat trout rises to a salmonfly
JUDY WANTULOK

Below: Crappie fishing from a canoe on Tongue River Reservoir
JACK BALLARD

Above: Streamer details
JASON SAVAGE

Right: Fly, rod and reel
VICTOR SCHENDEL

Above: Girl and mom fly-fishing.
ED COYLE

Left: Shortnose gar caught with a fly rod at Fort Peck Dredge Cuts Fishing Access Site.
NATHAN COOPER

Right: Longnose sucker
RYAN BRENNECKE

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Below: Fishing on the Kootenai River
JESS McGLOTHLIN

Bottom: A shore lunch of trout on the grill
PAT MUNDAY

Below: A stringer of freshwater drum from the Missouri River
ZACHARY R. SHATTUCK

Bottom: Filleting jumbo perch
ALLEN WIEDERRICH

Above: Landing a trout at a high mountain lake in the Absaroka-Beartooth Wilderness
JESS McGLOTHLIN

Below: Paddlefish
JEREMIE HOLLMAN

Top: Brook trout in Spanish Creek
THOMAS DAVID RITTER

Above: Pallid sturgeon ready for release
ZACHARY R. SHATTUCK

Above right: Green drake mayfly
BILL DELWICHE

Right: Dorsal fin of an Arctic grayling
JEREMIE HOLLMAN

Left: Sculpin in Tenderfoot Creek
THOMAS DAVID RITTER

Below left: Mountain whitefish in the Bighorn River
LISA DENSMORE BALLARD

Below right: Yellowstone cutthroat trout
MICHAEL L. HARING

Bottom: Golden trout
PATRICK CLAYTON

Silver lining

BY TOM DICKSON

Last year's fire season was one of the worst in Montana history. Twenty-one major fires and hundreds of smaller blazes burned a total of 1 million acres across the state. More than 4,000 local, state, and federal firefighters were deployed, and two were killed by falling trees in separate incidents. The smoke caused severe respiratory problems, especially among seniors and people with asthma, in dozens of communities. Some days, when we could hardly breathe in Helena, we tried to imagine the even grimmer air quality endured by fire crews and residents of Missoula, Eureka, and Seeley Lake.

Firefighting cost the state of Montana $75 million in 2017, and a recent University of Montana study estimates that tourism losses due to "severe smoke and fire" topped $240 million as visitors changed, shortened, and cancelled trips.

Despite the undeniable human loss and hardship, we know that some ecological good can come from forest fires. Fires clear thick underbrush that, if not periodically thinned, accumulates and fuels even more severe fires. By removing forest canopy, fires open areas to sunlight, fostering new growth of grasses, forbs, and shrubs eaten by elk, moose, and other wildlife. Fires knock back conifers overtaking native mountain grasslands, and are necessary for lodgepole pine cones to open and release their seeds.

Forest fires also are one of the mysterious forces of nature that coax morel mushrooms up out of the ground the following year.

For months, Montana mushroom fans have been quietly speculating that the 2018 morelling season may be the best in years. The combination of heavy snowpack this past winter and hundreds of thousands of acres of charred forest could produce ideal morel conditions. Especially promising: Many burned areas are on public lands accessible by roads.

The last time morel lovers saw so much burned forest was after the devastating 2007 Jocko Lakes Fire, which torched more than 36,000 acres and came within a mile of the town of Seeley Lake.

I drove to that fire site one morning the following summer with a friend who had never picked morels. After parking near a seep that oozed from the blackened soil, we got out of the car. I took just five steps, looked around at the ground, and said, "There are morels everywhere."

"I don't see them," my friend replied.

"Crouch down and look closer."

He did, then gasped. We spent the next hour within 100 yards of the vehicle, each filling half a pillow case with thumb-sized morels. On the drive home I told him he'd been spoiled—"like the kid who catches a 20-inch trout the first time out"—and recounted the many times my wife and I had searched for morels over the years and found only a few, or none.

This summer could be another banner year. I might join fellow members of the Western Montana Mycological Association, based in Missoula, on its annual Memorial Day weekend outing. When we head out, we'll no doubt follow the advice of Larry Evans, Montana's mushrooming guru and founder of the organization.

A few years ago while mushroom hunting together, Evans told me not to bother with intensely burned areas—"where the soil gets sterilized." Look instead for mosaics of burned and unburned ground, which indicate cooler fire temperatures as well as ground moisture that enhances morel production. I also learned to look for dead conifers that still retain some burnt-orange needles—another indicator of a slowly moving fire and damp soil.

Though morels are prized in our households, I'd be happy if Montana remained fire free this year. After all the smoke of 2017, residents and visitors deserve a full summer of sweet, clean air. But if a forest does burn, count on me to be among the hundreds of mushroom lovers wandering the charred aftermath next summer, pocketknife in one hand, pillow case in the other.

For tips on when, where, and how to locate morels, Google "Secrets of a Morelling Master" and read our article from March-April 2015.

Tom Dickson is editor of Montana Outdoors.

ILLUSTRATION BY STAN FELLOWS

Bigmouth Buffalo

Ictiobus cyprinellus By Zachary R. Shattuck

I first encountered the mighty bigmouth buffalo—the largest of all the sucker species—by chance. While snagging for paddlefish in a sluggish pool of the Missouri River upstream from Fort Peck Reservoir, I thought I'd tied into a whopper "spoonbill" and was about to fill my tag. The big fish turned out to be a powerful "buff" of about 15 pounds. While it wasn't the fish I was after, I was excited to have the opportunity to appreciate the size and beauty of one of Montana's largest fish—a native species many people don't even know exists.

IDENTIFICATION

The bigmouth buffalo is commonly confused with the native smallmouth buffalo (a fellow member of the sucker, or Catostomidae, family) and the introduced common carp (a member of the minnow, or Cyprinidae, family). All three are large fish with big scales. But the bigmouth buffalo has a mouth at the front of the head, much like a trout's, while the smallmouth buffalo and common carp have mouths angled downward like most other sucker species. Also, the common carp has two barbels (whiskerlike projections) on either side of the upper jaw and leading serrated "spines" along the dorsal and anal fins. Buffalo fish have no barbels and soft fin rays.

The bigmouth buffalo has a bluish-green or coppery back, fading to lighter sides. Its body is deeply rounded, as is the head. This is a big fish; in Midwestern states it can weigh more than 80 pounds. In Montana, biologists commonly net specimens over 25 pounds. The state record, caught in Nelson Reservoir, weighed 47.75 pounds and was 40.7 inches long.

RANGE AND HABITAT

In North America, the bigmouth buffalo ranges from Montana east through the Great Lakes states and from Saskatchewan south through Louisiana. As with the shortnose gar and smallmouth buffalo, the bigmouth buffalo's range in Montana is the species' westernmost extent. Like the smallmouth buffalo, the bigmouth lives in the Yellowstone, Missouri, and lower Milk Rivers as well as in impoundments, including Fort Peck and Nelson Reservoirs. While numerous other large-river fish fared poorly after their riverine habitat was impounded by dams, bigmouth buffalo have flourished with the newfound abundance of still water and plentiful zooplankton.

FEEDING

Bigmouth buffalo typically prefer warm water rich in algae and zooplankton, which the fish collect with fine, comblike gill rakers. Unlike most other sucker species, which feed mainly on a river or lake bottom, bigmouth buffalo feed throughout the water column.

REPRODUCTION

Bigmouth buffalo gather to spawn in May through June along vegetated lake margins and flooded backwaters, or in small tributaries. After several males surround a female, she sinks to the bottom to deposit her eggs over submerged vegetation. "All at once, the fish rush forward 15 to 20 feet, churning the water into foam with their tails in a spectacular display called 'tumbling,' which mixes the eggs and milt," notes *The Great Minnesota Fish Book*. (Would such a spectacle be considered an aquatic "buffalo stampede"?)

ANGLING AND FOOD VALUE

Owing to their preferred diet of zooplankton, bigmouth buffalo are difficult to catch. Anglers occasionally hook one using small pieces of nightcrawler, small doughballs, or corn kernels. Suckers are generally not sought for their meat because the flesh, while delicious, is filled with bones. But because bigmouth buffalo are so large, their bones can be easily eaten around, especially when the fish are smoked and the meat becomes flakey. Millions of pounds of bigmouth buffalo are commercially harvested in the Midwestern stretches of the Missouri and Mississippi Rivers each year and sold in markets throughout the eastern half of the United States.

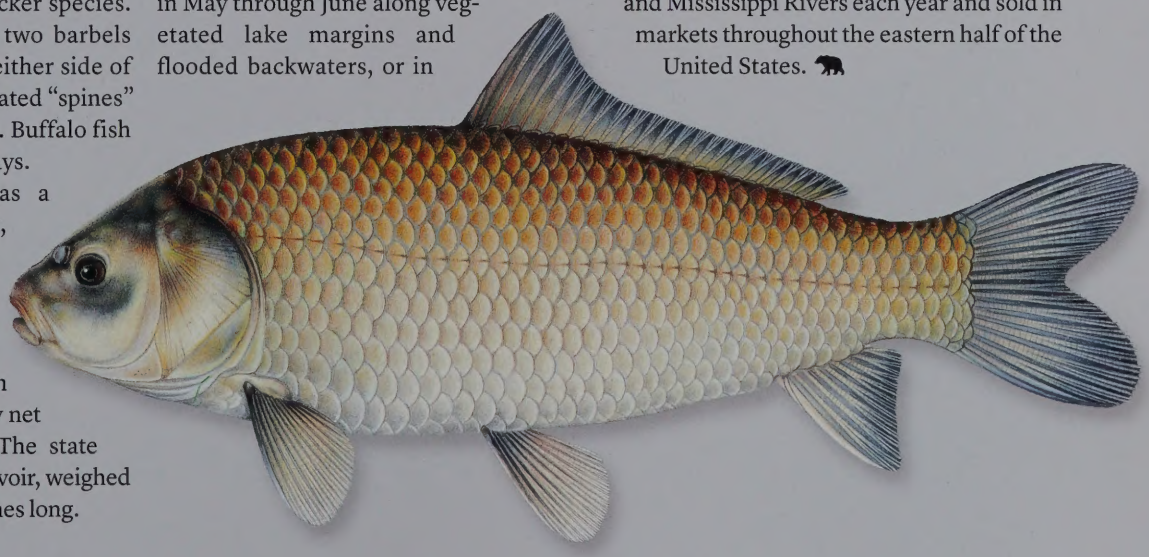

ILLUSTRATION BY JOSEPH TOMELLERI

SCIENTIFIC NAME

Ictiobus is Greek for "bull fish," referring to the species' big, round head, and *cyprinellus* is Latin for "small carp," because people mistakenly thought the bigmouth buffalo was related to the carp.

Zachary R. Shattuck is a native fish species coordinator for FWP.

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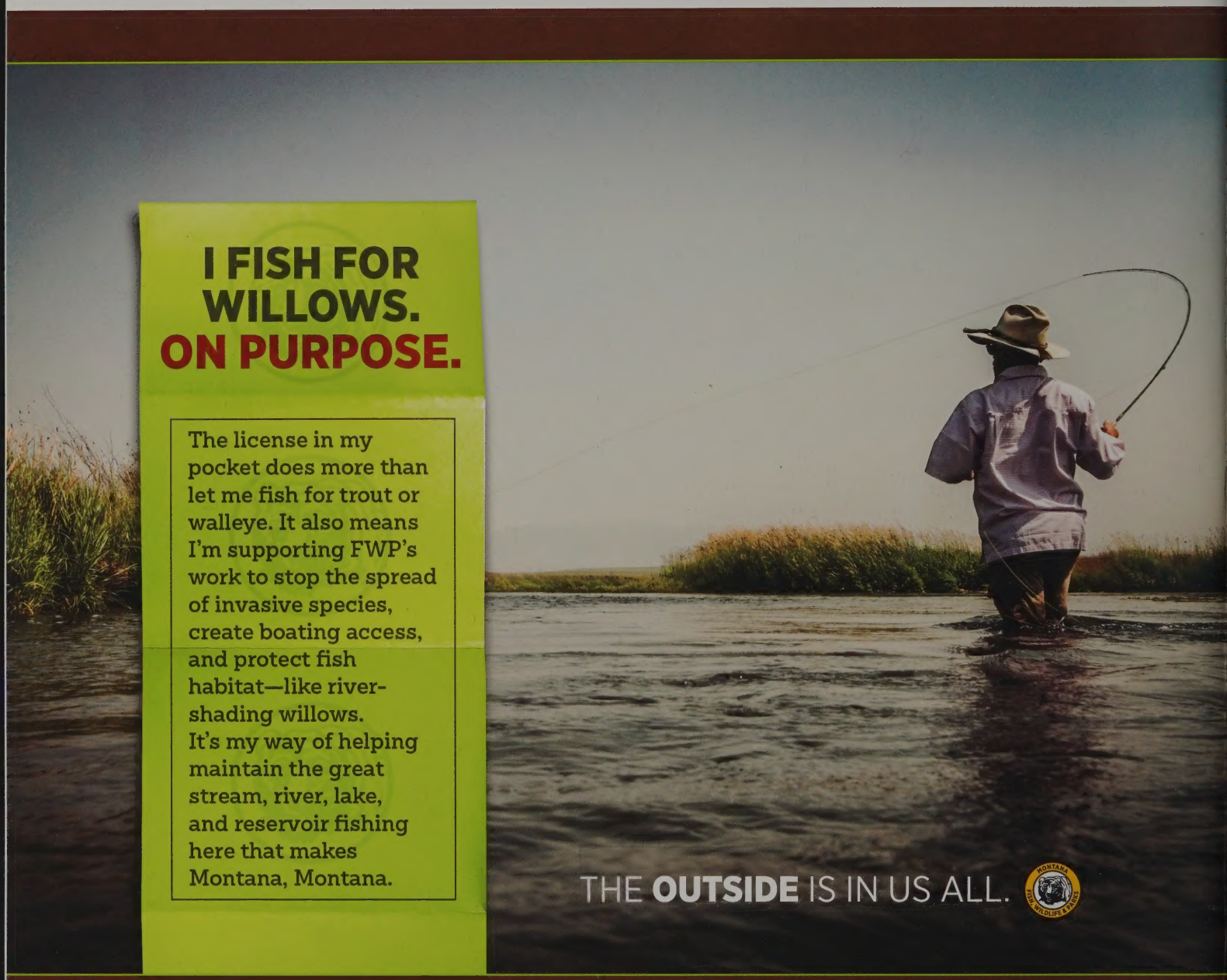
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